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CONTENTS

EDITORIAL:
Editorial Notes 1
The Signal Maintainer 2
The Proposed Investigation Regarding Rate Advances..... 3
A Law to Prohibit Railway Safety..... 4
Engineman Schroeder Acquitted 4
New Books 5

LETTERS TO THE EDITOR:
The "Conciliation Committee"—A Necessity; by Chas. C. Schnatterbeck 5
Government Ownership in Alaska; by Avery Turner..... 6
The Reliability of Automatic Block-Signal Records..... 6
An Early Locomotive Failure; by A. C. Frith..... 6

MISCELLANEOUS:
Study Your Apprentice Boys Carefully; by G. M. Basford..... 7
*New Montclair Station of the Delaware, Lackawanna & Western... 9
Freight Rate Advances and the Interstate Commerce Commission..... 10
The Union Pacific Plan as Approved..... 12
Powdered Fuel for Locomotives; by Walter D. Wood..... 13
Train Despatchers' Convention 15
*American Society for Testing Materials..... 15
The Railroad Valuation Committee..... 18
*The St. Paul Improvements in Milwaukee..... 19
Assignment of Equipment Valuation by States; by A. I. Thompson.. 21
Need of Better Boxes for Freight..... 23
Newark Bay Trestles Built in Twelve Days..... 24

GENERAL NEWS SECTION..... 25

*Illustrated.

C. D. YOUNG, engineer of tests of the Pennsylvania Railroad, in discussing the report of the committee on mechanical stokers at the recent convention of the Master Mechanics' Association, stated that his road was arranging to make some tests with powdered or pulverized fuel. The preliminary tests are to be made on a locomotive type boiler, but not on a locomotive, in order to obtain data as to the proper size and the kind of burners and the principles governing the burning of powdered fuel. In Mr. Young's opinion, it will be possible to more nearly obtain the high capacities from the power at high firing rates than when coal is burned in its ordinary form. Marked progress is being made in the use of powdered fuel for industrial purposes, including its use in cement mills, and more recently of its application to heating furnaces, and it is expected that this will be followed by its successful application to locomotives. The principal advantages of pulverized fuel are the better and more prompt intermixture of the gas and the air, thus providing a practically perfect combustion and the absence of smoke. This will necessarily be followed by better performance of the boiler and the locomotive as a whole. A large number of attempts have been made to use a fuel of this kind in the locomotive, but without success. Walter D. Wood, in an article in this issue, analyzes the failures that have followed these attempts, and offers suggestions as to how they may be overcome. A difficulty not mentioned by Mr. Wood, but referred to by H. T. Bentley, assistant superintendent of motive power and machinery of the Chicago & North Western at the Master Mechanics' convention, is that of carrying the pulverized fuel on the tender. It will probably be necessary to entirely redesign the tender to provide for its successful handling. It is finer than soot, if that is possible, and may have to be carried in air-tight containers. Its storage at the coaling stations and its transfer to the tenders offers a complicated problem which must be solved after its use in the locomotive firebox has been demonstrated a success. Its extended use for industrial purposes has again attracted attention to its possibilities for a locomotive fuel and it is understood that experiments will be made by other roads in addition to those which are planned on the Pennsylvania.

THERE is a growing tendency among wide-awake railway executives to find out some of the reasons why railways are not as popular as they might be. One railway president has recently adopted a rather novel way of satisfying his curiosity on this subject. His son's room-mate at college, on the lookout for a remunerative occupation during the summer vacation, applied to this railway president. He was promptly given a job which appeared so "soft" that he almost hesitated to accept it. He is paid $85 a month, and his instructions are to ride up and down the railroad wherever he pleases, get on and off trains wherever fancy suggests, but to keep his eyes open and report to the president by letter whenever he observes anything in connection with the operation of the road which, from the standpoint of the traveling public, seems inexplicable or wrong. If he hears criticisms of the dining car service, or notices dirty, poorly kept stations, or receives discourteous treatment from employees, or observes any of the little things incident to a railway journey that so often leaves the traveler with a feeling of resentment, he is to sit down and write the president a letter about it. Likewise, if he receives unusually courteous treatment, or notices instances of conspicuously good service, he is likewise to write the president a letter. Every railway, of course, receives reports from its own officers and employees on such matters, as well as many criticisms from patrons. But railway men do not always view such things from the standpoint of the public, while many of the complaints received are written by habitual kickers, who frequently blame the railway for the results of their own negligence, or fail to appreciate the conditions, thus making their statements useless without an independent and often futile post mortem investigation. The young college man, in his personification of the general public, will, in the circumstances, hardly start out in a captious spirit,

or with any preconceived prejudice against the road, and while probably unsophisticated as to the technicalities of railroading, he will naturally be sufficiently impressed with a sense of responsibility to refrain from making criticisms without having been careful to ascertain the facts and conditions. If he is at all observing the information he will collect will yield a handsome return on the investment involved.

NO amount of attention or study seems to be too great in deciding upon the details of construction or design of equipment, or the methods of operating a railway. While they are important and need this attention, it is of far greater importance that the selection of men and the placing of them where they can be used to the best advantage be given the proper consideration. Suppose, for instance, it is necessary to promote or transfer a foreman, or that for some reason he is unable to attend to his duties; how is his successor chosen? Are there any scientific records to be consulted which will assist in selecting him, or is he chosen on the spur of the moment and possibly on the basis of some spectacular piece of work which he has recently done? Very often this is the case. Very often also the results are discouraging, for the man may lack in executive ability or in other qualifications, which are vitally necessary to the proper performance of his duties. A number of years ago Le Grand Parish inaugurated a scheme on the Lake Shore & Michigan Southern, by which it was possible to get a record of the personal characteristics of each man in the mechanical department and to follow him up so that if improvement was not made in those features in which he was deficient, his superior officer could be called to account for not having given him a proper amount of attention, or, if it was not the fault of his superior, the man could be called to account, and if advisable eliminated from the organization. The way in which this was done is described in an address, reproduced on another page, which was made by George M. Basford before the recent annual conference of the apprentice instructors of the Santa Fe. This same scheme has been used with excellent results in other industrial organizations and is deserving of the most careful consideration on the part of all industrial managers and railway officers. Too little attention has been given in this country, not only to the selection of workmen and their promotion to more important positions, but also in the assignment of the men to the classes of work for which they are best fitted. Men who would make splendid workmen on certain classes of work in an office or in a shop, have fallen down miserably and made failures because they were used upon an entirely different class of work in the same office or in the same shop, when they might just as well have been properly placed, had those in charge stopped to analyze their mental and physical characteristics before assigning them to their duties. More attention has been given to this feature in European countries and many industrial managers in this country are awakening to its importance. It is a new science and must be developed just as have been certain systems of management and railroad operation, which have been introduced within recent years and have become important factors in the efficient and economical railway management of today.

WHY railway men take to rest cures or go into other businesses is illustrated by the experience of roads traversing the states of Arkansas and Oklahoma with the vital question of regulation of screens for passenger coaches. The Arkansas legislature at its last session passed a law requiring the railways to equip their passenger cars from May to November with wire screens at each window, and to keep the same in good repair. A fine of $10 to $25 per car per day was provided for failure to comply with the law. The act "being," as it set forth, "necessary for immediate preservation of the public peace, health and safety, and an emergency being deemed to exist," went into effect on May 1. There are a good many flies and mosquitoes in Arkansas; but the Solon who drew up the bill apparently forgot that the same emergency applied in the case of those that might fly in the doors and ventilators, which the law does not require to be screened. Perhaps he was more concerned with regulating the railways than with regulating the flies and mosquitoes. One railway, whose main lines cross the state in such a way that it had to equip practically all of its coaches, complied with the law in good faith at an expense of some $6,000. After having been in service only about two months, nearly a third of the screens have been destroyed by passengers. The passengers object to them because they think they interfere with ventilation; and they prefer ventilation to the "public peace, health and safety." And the Corporation Commission of the adjacent state of Oklahoma is apparently of the same mind. For it has issued a proposed order, to be considered at a hearing on July 1, prohibiting the railways from operating cars in that sovereign state that have screens on their windows. Under the recent Supreme Court decisions it would probably not be construed as an undue interference with interstate commerce if the flies and mosquitoes that entered the cars through the doors and ventilators in Arkansas were liberated through the windows in Oklahoma. What the railways that run interstate trains between Oklahoma and Arkansas would like to know, however, is what they are going to do if the Oklahoma commission finally prohibits the use of screens. Must they stop all trains at the border and take off the screens when they are going into Oklahoma, and put them on again when they are going into Arkansas? And if so, if a train is longer than the width of the state line, how are they going to keep from violating the law in both states. Under the Arkansas law the screens must be kept on until after a train has crossed the state line from Arkansas into Oklahoma; but if they are kept on until after the train crosses the line that will be a violation of the law in Oklahoma. A situation will thus be created similar to that proposed by the Kansas legislator who recently introduced a bill requiring that when two trains met on different tracks at crossings, each should stop until the other had passed. If this sort of thing keeps on until railways are required to make complete changes of equipment as well as rates at state lines, one of the problems encountered in physical valuation will be solved. The state of South Dakota, for instance, would then find it much easier to ascertain its proportion of the value of equipment used in transcontinental trains, as well as to prove that it is discriminated against in the assignment of parlor cars.

THE SIGNAL MAINTAINER.

"THE man behind the gun," in the signaling world is the maintainer. To the degree that he is intelligent, well trained and conscientious, in the same measure is the service efficient—if there is a sufficient number of him. In maintenance of signals, as in operation of trains, a large proportion of the failures reported are due to faults of men. The supervisor naturally seeks the best men that can be found. Doing this, he must, if he is going to succeed, be supported by a strong management. The question goes right up to the general manager. Seeking the best men means, not merely that reasonable wages shall be offered and fair conditions of work provided for, but that a sufficient force shall be educated. For work on railroads in rural districts, the candidates who are in many respects most satisfactory are young men who have been brought up on the farms or in the villages along the line. But to secure from this class a satisfactory force of signal maintainers it is necessary for the railroad officer to offer apprenticeships which shall be attractive to the country boy at such an age that he can be thoroughly trained in the service, so as to be well prepared at the proper age to assume the duties of a responsible position. While on many roads the practice in this matter is commendable, it must be said that there is far too little of it. Statements of signal supervisors that their maintainers are "rovers," or that it has been found difficult or impossible to get satisfactory men, are common.

In an editorial in our issue of June 13, the work of the maintainer was briefly touched on, in connection with an abstract of signal performance records of the Baltimore & Ohio. That

the position is an important one is a point which needs no argument. On a road like the Baltimore & Ohio the maintainers, almost without exception, give evidence of entire competency. But by far too large a proportion seem not to think much of preparing for promotion to higher responsibilities. A considerable share of the maintenance force in any signal department ought to be men sufficiently studious to fit themselves for advancement as new men are needed in the supervising places. Where the country boys available along the road do not measure up to this standard the railroad officer has got to secure graduates from technical schools, to be trained by doing actual work in subordinate places. This is his only adequate resource. These should be employed in sufficient number to enable him to at all times keep a full force of well qualified supervisors, assistant supervisors and foremen of maintainers. That the keeping of well qualified maintainers is not always an easy task is sufficiently indicated by the record of three months' discipline for a variety of offenses and delinquencies which was given in our article February 21, which record is not different in its general character from that on some other roads. The gravity of the maintainer's responsibility is obvious. By his neglect a signal may give a false clear indication; but by the law of chances, judged by past experiences, *probably* no collision will follow. Then his negligence may go undetected. He must, therefore, have the force of character to do his best without being checked by his superior. Thus, each maintainer, working along the line by himself, with his supervisor many miles away, is under a temptation to relax vigilance, because the liability to dangerous results from negligence is so remote. And if his lack of vigilance, or inefficiency of any kind, does produce a dangerous condition, and the fact is known, still he may be tempted to falsify his report for the purpose of concealing a defect for which he is responsible, and presumably censurable.

The question whether maintainers are sufficiently vigilant in guarding against dangerous failures being, therefore, one which is most difficult to settle, the assurance of the signal engineer that the maintainer is vigilant in all his duties must be based mainly on the engineer's knowledge concerning the records of the much more numerous non-dangerous failures, and how the men deal with them; and concerning the moral character and general behavior of the maintainers.

An important element in the education of maintainers, and in maintaining a high moral standard is the regular holding of conferences by the signal engineer with his supervisors and maintainers, as often as every one or two months. A number of the most enterprising signal engineers have established these institutions and they report highly satisfactory results therefrom. In view of the isolated character of the maintainer's work and the importance of honesty as one of the elements in his qualifications for his position, conferences are to be looked upon as a necessity. Mutual confidence between him and his supervisor is a vital feature if the superintendent is to have at all times the assurance that his signal system is being kept up to the highest standard of efficiency; and this can be secured only by free and frank intercourse.

In connection with the subject of conferences mention may be made of an experiment with records which has been tried to a limited extent, namely, a monthly statement, sent to all the men, in which the records of the different maintainers are set forth in the order of their excellence. With this arrangement, the most efficient maintainer may stand at the head of the list for many months in succession. One signal engineer reports this scheme as satisfactory; emulation is stimulated. Others, however, say that the result is the other way; the comparisons discourage some of the men. It is much to be desired, therefore, that those who have tried this scheme shall report their experience.

The whole subject of the maintainer and his work is worthy of thorough study. What with new types of apparatus, adverse conditions due to rain, frost or snow, and the difficulties inherent in the delicate character of the functions of signaling appliances, he is often confronted by problems which routine instructions do not cover and in which he is successful only by reason of native ability and cultivated ingenuity. On the Baltimore & Ohio, when a maintainer discovers and cures an obscure fault in the operation of a mechanism he is likely to receive a congratulatory letter from his superior officer. For reasons suggested in our former article, we are not setting up the Baltimore & Ohio as a model to be emulated by other roads for, not having made careful studies on other roads, we do not know how many of them have already a signal administration which is just as good as that on the B. & O.; but congratulatory letters may be warmly commended to every one, on general principles. Even if some exigency, or precedent, or prejudice should forbid the sending of such a letter, after it had been written, the time spent would not have been lost; the mere writing of such letters is a valuable education to the man who writes them!

The quality of maintainers' minds and consciences, as a subject for discussion in the Railway Signal Association, might well supplant, for a time, the dimensions of the bevel on binding posts and questions of sixty-fourths of an inch in the diameter of switch rods.

THE PROPOSED INVESTIGATION REGARDING RATE ADVANCES.

THE Interstate Commerce Commission's denial of the petition of the eastern railways for a reopening of the old rate advance case, No. 3400, is about what the carriers should have expected in view of the difference between their present request for a 5 per cent. horizontal advance and the nature of the advances formerly sought. The commission's announcement of a general investigation as to whether present rates of transportation yield adequate revenues to the carriers in Official Classification territory, and, if not, as to what course they may adopt to deal with the situation, is entirely satisfactory to the railways, as indicated in a statement given out by President Willard of the Baltimore & Ohio. The railways were not so anxious to have their case treated as a revival of the former one as to get it before the commission without the necessity of spending some $250,000 for the preparation of new tariffs with no assurance that the expenditure would serve any useful purpose. As Mr. Willard observes, the proposed investigation by the commission will afford both the railways and the shippers ample opportunity to be heard on the question of the sufficiency of the existing rates. In its former decisions in the rate advance cases the commission said that if its expectations as to the earnings of the railways proved unfounded, and conditions changed, it would reconsider the question. It now states that it is "of the opinion, from a consideration of the allegations of the petition, that the need of and justification for additional revenue should be at the present time further examined." This is all that the railways ask. There seems no ground for feeling that determination of the matter has been delayed by the form of the commission's order.

The commission undoubtedly has the power to conduct any kind of an investigation of the matters under its jurisdiction that it cares to. Commissioners Clements, Marble and McChord, in their dissenting opinions, indicate some doubt as to the value of such an inquiry as that proposed. They take the ground that the commission should not approve of increases in rates before they have been filed and shippers have had an opportunity to attack them. But the shippers will be afforded full opportunity by the investigation to present any arguments or information in reply to the claims of the railways that they see fit. Nor is there any indication that they will be in any way precluded from subsequently attacking any specific rate or rates that may be filed by the carriers if the commission does render a general opinion that the roads need more revenue.

As Commissioner Clements says, it is not contended that upon such a general inquiry the commission could enter a for-

mal order requiring or authorizing an increase of rates. The commission is not empowered to raise rates or to prescribe minimum rates. But if the commission finds that the present earnings of the carriers are sufficient it will say so and the incident will be closed, except that the railways will still be free to file tariffs at any time advancing such individual rates as they believe they can defend. If on the other hand, the commission sustains the claims of the railways that their earnings are inadequate, and the carriers accordingly file advanced rates, the advanced rates will still remain subject to the legal requirement of reasonableness. Each of them will be open to complaint by the shippers concerned, and the burden of proof as to the reasonableness of the advance of each will be upon the carriers.

It may happen that the commission will hold that the railways should be allowed to earn larger revenues, but that a horizontal advance is not an equitable way of getting them. In that event the commission possibly would signify what kind of advances should be made. This would impose upon the carriers even less of a burden of proof, while that upon the complainants would be correspondingly increased. However, no opinion of the commission and no financial condition of the carriers can render any rate or group of rates permanently reasonable. The carriers could not expect any guarantee that even rates advanced with the express permission of the commission would not be subject in future to attack, and if shown unreasonable, to reduction, whatever the commission may find as to their present necessities. If the commission finds that the interests of the commerce of the country demand the encouragement of transportation development by higher rates, the working out of the details of the way in which advances shall be made will present no great difficulties.

A LAW TO PROHIBIT RAILWAY SAFETY.

KANSAS has a new law which provides that any person who shall manipulate or tamper with any switch stand, target, switch light or light controlling the movements of trains, for the purpose of misleading or deceiving engineers, firemen or train crews, shall be deemed guilty of a misdemeanor and fined. There is a further provision that any act in disobedience of this law, which results in death or great bodily injury, shall be deemed a felony punishable by imprisonment. This measure affects all the railways which conduct surprise tests, and effectually puts an end to that very excellent method of determining how well signals are being obeyed.

The surprise test is the railway officer's safeguard against disobedience of signals. It enables him to discover such habitual carelessness on the part of trainmen as would be likely to cause disaster were the signals in their positions of warning under the actual conditions of operation. And although it has held an important place in railroading for many years, it is not as old as the condition it is designed to discover and prevent, for it was not originated until long after the fact was established that carelessness is one of the most common causes of railway accidents. By the aid of the surprise test railway officers have been enabled materially to reduce the number of accidents; and the place of this safeguard in the safety scheme is so well recognized that the Interstate Commerce Commission has gone on record criticizing some railways for not having made more general use of it.

This test introduces no element of actual danger. It merely simulates the condition of real danger which requires the engineer to act. Its only effect upon enginemen is, perhaps, a little inconvenience in making them stop more often that they would otherwise. It is true that it is a form of espionage, but it is an entirely justifiable form, both in theory and because of its actual record of having prevented innumerable enginemen from forming habits of carelessness that would certainly lead to disaster, and of making it possible to weed out those in whom carelessness has become habitual. It has no terrors for enginemen who obey the rules, and it is not a hardship except for such as desire to disobey, and are afraid of being caught at it.

Why a safety measure of such recognized value should be made a crime is not clear unless it is desired to put the men of careless habits beyond the reach of discipline and enable them to disregard signals with impunity. This the Kansas law does. It is to be presumed, of course, that the railways will obey it. But whenever a Kansas trainman is subjected to discipline for having disobeyed a signal he may make the defense that he suspected a surprise test, and chose to disregard the signal ahead because he thought it was an unlawful one. And discipline will, perforce, be but rarely attempted unless operating officers discover some way of finding out just when signals are going to be at stop as the result of actual operating conditions, so that they can be on hand—accompanied by a sufficient number of reputable witnesses to prove that they had nothing to do with putting the signal at stop.

This is one of the worst laws that ever disgraced a statute book. It destroys safety precautions and it is likely to be the means of destroying human lives. It removes from railway operation one of the best assurances of safety, and takes from railway officers one of their best means of enforcing needed discipline.

And why? The legislative committees of the various railway brotherhoods could answer. And the same committees could explain the many full-crew and electric-headlight bills, and most of the other destructive legislation which is rolling an overwhelming burden of unnecessary expense on the railways of this country. There seem to be only two possible explanations of legislation such as this. One is that those who are responsible for it deliberately sell the public welfare in exchange for union labor votes. The other is that their mental condition is such that they ought to be put in a home for the feeble-minded.

ENGINEMAN SCHROEDER ACQUITTED.

THAT juries very rarely convict an engineman of manslaughter for causing deaths of passengers or employees is a well known fact. Actual punishment by imprisonment for any great length of time is still more rare. It was not surprising, therefore, that William H. Schroeder, the engineman who figured in the Corning collision of July 4, 1912, was acquitted; but, what is quite unusual, we have in this case a clear and illuminating statement of the circumstances leading up to the acquittal. It is found in a letter in the New York *Times* signed James O. Sebring, assistant district attorney. After narrating the facts, with which our readers are familiar, he says:

> The whole blame for the loss of life and the injury to the passengers must forever remain where it rightfully belongs, with Schroeder. The only reasonable explanation of his conduct is that he was asleep; and now, from various sources, there arises the hysterical and unwarranted cry that that acquittal has transferred all the blame from his shoulders and placed it upon that of the management of the railroad company. The verdict represents one more failure of justice. It was not the outcome of the careful or deliberate consideration of the proof, but mainly the result of sympathy for Schroeder, and the efforts of the Brotherhood of Locomotive Engineers and other unions of railroad employees to secure his acquittal. The dismissal of the first indictment and the long delay necessary to bring him to trial upon a second indictment; the recent death of his wife; the long service with the company, and the testimony of six influential citizens of Elmira as to his good character also aided him.
>
> But the principal thing that brought about the farcical verdict was the tremendous and overpowering influence of the railroad employees' unions. The members of these unions were omnipresent in Hornell. They were everywhere. They crowded the Court House; they filled the lobbies of the hotels; they were everywhere upon the streets. They were talking, urging, pleading, and threatening. They worked day and night. They created such a sentiment in Schroeder's behalf that no one could expect that jurors left to roam at will and associate and be with them, could withstand the pressure brought to bear upon them. With such influences surrounding the jury no one could expect a conviction.
>
> No substantial defense was established. Had it been a civil action, the court would, upon the evidence, have been compelled to direct a verdict. It being a criminal action, the court was compelled to leave it to a jury.

We print this as an illustrative instance of the workings of our laws. A man who voluntarily gets into a cab to run a fast train when he knows that his brain is drowsy from drink, deserves severe punishment; all impartial persons will agree

to that. But that convictions for manslaughter have any deterrent effect on other enginemen is more than doubtful. Careful observers believe that the good effect is nil. Moreover, if the prevention of collisions is to be systematically studied, we must go more deeply into the psychology of the question. The influences that freed Schroeder are not so very different from those which play their part in other criminal trials. Extravagant expressions of the sympathy which is ready to forgive the unfortunate are well known to thwart justice in every court. Juries who convict a man of a crime often add a recommendation to mercy. Judges, their minds weighed down by the evils and wretchedness constantly forced on their attention, exercise leniency constantly. They have to do this to preserve their humanity. The administration of cold and rigid justice encounters obstacles at every turn.

It appears that the jurymen at Hornell were permitted to mix with the crowd during nine days. This looks like culpable disregard of an elementary precaution; still, it is very unlikely that the result would have been different if the jurymen had been locked up. The simple plea that the punishment is too severe for the offence has carried the day in hundreds of trials. Chairman Stevens, of the New York State Public Service Commission, a lawyer who has had long experience as a prosecuting officer, says that juries will not convict of manslaughter unless they believe that the accused man meant to kill somebody. The true cure for negligence in the cab is just what it was before criminal trials were ever thought of: patient carrying out of those means, well known to railroad officers, which are calculated to make all of the enginemen as intelligent, conscientious and reliable as are the best and most efficient men in the force.

This course is logically necessary, even if one were to pin his faith to automatic train stops, for there is no excuse for low standards of personal character or weak discipline, however perfect may be the mechanical accessories which are provided. Indeed, one of the best things that can be said of the automatic stop is that it makes runners careful.

NEW BOOKS.

Steel Designing. By Edward Godfrey, structural engineer for Robert W. Hunt & Co. Size, 4 in. x 6 in.; 492 pages; illustrated. Published by the author, Monongahela Bank Bldg., Pittsburgh, Pa. Price, $2.50.

"Steel Designing" is the third of a series on structural engineering, the first book being devoted to tables and the second to concrete. The author states in his preface that it is the object of the book to set forth sound engineering in steel design. It is intended to reach not only the designer but the student, inspector and consulting engineer. One feature of the book is a collection of 150 drawings illustrating designs of various classes of structures, which were taken from descriptions in current magazines. A set of definitions of terms used in steel design and erection is included and a complete set of suggested specifications for structural work is added.

Poor's Manual of Public Utilities. Published by Poor's Railroad Manual Co., 535 Pearl street, New York. Price, $7.50.

This is the initial annual number of this Manual of Public Utilities. The fact that it has been compiled and is being published by Poor's Railroad Manual Co. gives it, of course, a very considerable degree of authority. It is the only manual devoted entirely to statements of public service corporations, and the publication of a book of 1924 pages, devoted entirely to street railway, gas and electric light, water power, telephone and telegraph companies, is evidence of the number and importance of such corporations and of the large number of investors who have become interested in their securities. The manual gives figures for about 8,500 corporations, which is probably nearly every corporation performing what may be called public utility operations in the United States. The balance sheet and income accounts of the more important companies are shown not only for the current year but comparative figures are also given which add very greatly to the value of the manual.

Letters to the Editor.

THE "CONCILIATION COMMITTEE"—A NECESSITY.

BALTIMORE, Md., May 26, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The energy displayed by the national and state legislatures to regulate the management and operation of the railroads under the guise of a public necessity, although such legal regulations entail the expenditure of considerable money which might be converted to the improvement of the railroads, has given birth to the idea of organizing and maintaining a so-called "Conciliation Committee."

The primary object of this Conciliation Committee, which would be supported by the railroad as any other official branch of its business, would be to "swing the pendulum" of harmony between the government and the management, and incidentally keep in touch with and awaken the employees to the legal responsibilities of their railroad in order to prevent the payment of heavy penalties for neglect in carrying out the demands of the government.

To plead that every railroad of consequence has a well organized legal department whose duty it is to keep the officials informed of the legislation bearing on their corporate powers is no bar to the action that will undoubtedly be taken by the management in the early future to organize and maintain the Conciliation Committee. I venture to say that the sphere of this committee will be broadened and become so important as to be valued for more reasons than one, for its principles and duties will dovetail the various branches of railroading. It will also relieve the legal department of duties that are now only incidental to the proper interpretation of the law and the legal protection of the rights and franchises of the railroad.

When the Conciliation Committee idea will become a live issue will depend upon the wisdom of the men who are at the helm in fathoming the destiny of the railroads and who will have to contend with new problems as a result of the present valuation work where it has been analyzed by the Interstate Commerce Commission.

The personnel of the Conciliation Committee should be made up of representatives from the various departments of the railroad, and the chairman should be qualified to pass judgment on such matters as ordinarily require unusual tact, experience, reputation for honest convictions and an unbiased intellect. Favoritism in the selection of the personnel of this committee should not be a factor, but every effort should be made to create and maintain harmony among the members as an example for the many employees of the railroad whose opinions should be heard and acted upon for the best interests of the railroad company.

By holding periodical meetings at various points on the line of the railroad, and calling these "get together" meetings primarily for the intercourse of employees, with a limited talk by one of the committee who shall explain the responsibilities of each employee toward his employer and the company toward the government, will, I am sure, accomplish greater good than by simply directing the various department heads to follow the letter of the law without making a special effort to see that these regulations are carried out by the employees. The management sometimes never learns of an infraction of the law until the company is penalized for a violation that could have been prevented had the proper precautions been taken to see that the men in the field had complied with the request of the management through the department head.

An advantage also to accrue from the periodical meetings of employees is to make them better acquainted with one another and by learning their individual views as regards the solution of problems immediately arising in their own spheres of endeavor, the management could, through the intercession of the Conciliation Committee, accomplish the harmonious working that means so much to the welfare of the company.

The key note of the whole situation is the necessity of the management getting closer to the employees of the company—the men whose actions count for so much and whose opinions are sometimes worth a volume of theory—and by practicing a fair policy in instructing the man who makes his living by physical exertion, and he who depends on his mental faculties to help earn for him a comfortable living, it will be possible to accomplish all that is intended by the organization and maintenance of the Conciliation Committee.

CHAS. C. SCHNATTERBECK.

GOVERNMENT OWNERSHIP IN ALASKA.

AMARILLO, Texas, June 15, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In an editorial in your issue of May 23 you covered the question of government ownership in Alaska very clearly and should create a great public interest in the subject.

How many members of the commission appointed to investigate the subject have been over the routes recommended, know Alaska or have had extensive experience in such work? It is doubtful if they had reports of surveys and proper data to justify their recommendations. There is a suspicion that they were too anxious to get their recommendation before Congress in order to comply with the party platform.

They propose a cost of $35,000,000 at first. This sum is one-half the estimated income tax for a year, which has heretofore been considered an emergency tax, and as the advocates of government railways propose cheap rates we can be sure that the privately owned railways and tax payers of the states will be taxed to build these Alaska roads and later to operate them.

We know nothing about the traffic possibilities, but from reports of government prosecutions of interests that have attempted development there, and of the restrictions and requirements imposed on mining and timber business it would appear that development would be very slow and that earnings will be light and the deficit made good by taxation of the states.

A sure and reasonable proposition is to guarantee the interest on bonds of short lines from the coast and aid them by liberal requirements in the development of business. But the essential thing is to place the authority and responsibility for the location of the lines in the hands of men of experience and competence and eliminate all theorists and politicians.

The main point is, there is no right or justice in taxing the Texas farmer to build and operate railroads as an experiment in Alaska.

AVERY TURNER,
Vice-President Southern Kansas Railway of Texas, Pecos & Northern Texas Railway, and Pecos River Railroad.

THE RELIABILITY OF AUTOMATIC BLOCK-SIGNAL RECORDS.

WASHINGTON, D. C., June 16, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Your articles reporting performances of automatic block signals, published in your issues of February 21 and June 13, have been read with much interest. Some operating officers are making comparisons that they never made before. The different bases on which results are tabulated, and the suggestion of imperfection in the records are points on which your comments are very brief. This is a matter which it is to be hoped will receive further discussion. To some readers the query arises whether these figures, showing such varied results, may not be looked upon as confirming the opinion, held by certain prominent signal engineers, that, because of negligence on the part of the men who should make reports, signal performance records are in many cases unreliable. The claim has been very definitely put forth that enginemen do not carefully report all failures, that maintainers successfully conceal faults for which they themselves are responsible, and that officers, not fully appreciating the importance of a high standard of efficiency, knowingly tolerate this loose practice. How generally does this idea prevail? Insofar as it has a reasonable basis of fact, there should be a demand for a thorough airing. Automatic block signals are now generally recognized as a vital element in the safety of travel and the public interest in them should be intelligently satisfied. If railway officers are to go on indefinitely in a course which seems to put dependence for safety in part on good luck there will be ground for regret that the Block Signal Board was allowed to die. Something may happen to show that governmental investigations are a good thing. For the present the government has no experts at work; it is the duty of the railways as a body to do the expert investigating themselves. Is not this a fair proposition? Do not the signal engineers of the country, and the operating officers who share with the signal engineers the responsibility for this feature of railroad work, desire to see the whole truth of the situation, as regards the efficiency and safety of American railroad signaling, clearly set forth, for the benefit of all concerned?

P. B. W.

AN EARLY LOCOMOTIVE FAILURE.

WINNIPEG, MAN., June 23, 1913.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

With reference to the article in the *Daily Railway Age Gazette* of June 16, giving particulars of tombstones at Bromsgrove, England, it may interest you to hear that there was, a few years ago, a tombstone in the churchyard at Whickham, a few miles from Newcastle-on-Tyne, on which are lines almost identical with those quoted by you. I saw this tombstone in March, 1881, and copied the inscription at the time, and for all that I know to the contrary, it may be standing there still, as it was then in a fair state of preservation. You will note that this was erected in memory of an engineer who was accidentally killed a few months previous to those referred to by your article. The inscription as I saw it runs as follows:

"Erected at the expense of the workmen on the Newcastle and Carlisle Railway to the memory of Oswald Gardner, locomotive engineman, who unfortunately lost his life on the above railway near Stokesfield station, from the connecting rod of the engine breaking on Saturday, the 15th day of August, 1840. He was 27 years of age, and was much esteemed by his fellow workmen and by all who had the pleasure of his acquaintance." The following epitaph was composed by an unknown friend to commemorate his worthiness, and left at the Blaydon station:

"My engine now is cold and still,
No water does my boiler fill,
My coke affords its flame no more,
My days of usefulness are o'er,
My wheels deny their noted speed,
No more my guiding hand they heed,
My whistle too has lost its tone,
Its shrill and thrilling sounds are gone,
My valves are now thrown open wide
My flanges all refuse to guide,
My clacks also, though once so strong
Refuse their aid in the busy throng,
No more I feel each urging breath,
My steam is all condensed in death,
Life's railway o'er, each station past
In death I'm stopped, and rest at last,
Farewell dear friends, and cease to weep,
In Christ I'm safe, in Him I sleep."

A. C. FRITH.

EXTENSION OF ARGENTINE RAILWAY CONCESSION ASKED.—Dr. M. J. Paunero, concessionaire for a railway from Mar del Plata, has applied to the Argentine congress for an allowance of six months for signing the contract and making the guarantee deposit.

STUDY YOUR APPRENTICE BOYS CAREFULLY.

An Address Delivered at the Annual Meeting of the Santa Fe Apprentice Instructors, Held at Topeka on May 27.

By G. M. Basford.

In 1899 the Railroad Y. M. C. A. building at Argentine, Kan., was erected. When completed John Purcell, now assistant to the vice-president, started an evening class for shop employees, which was the first on the Santa Fe system, or so far as we know, on any other system. This class was composed of four men and two boys.

In 1900 Mr. Purcell was transferred to Ft. Madison as master mechanic, at which time he had about 32 apprentices in the shop. He called all the boys into the office one day and had a talk with them about starting a class. None of them took any interest in it; in fact, some remarked they would leave the service of the company rather than join the class. However, he found one or two of the boys were somewhat undecided and bashful and, keeping them after the other boys left, persuaded them to join the class. He arranged with one of the merchants of the town for several sets of drawing instruments, standing good for them until the boys were able to pay for them at the rate of a dollar a month. The class was started with four boys, but after the first lesson the others came to the office and asked to join. In the course of two months the full number—32—were in the school. Mr. Purcell paid the instructor and the rent of the hall out of his own pocket and the school was continued during the winter months while he was master mechanic at that point. His successor did not feel disposed to advance the money to keep the school going. A great many of the boys kept up their drawing work and at the present time eight of them are apprentice drawing instructors at various points on the system, while others have filled positions of master mechanics, road foremen of engines and roundhouse foremen.

In 1903 J. W. Kendrick, then vice-president, met the speaker in New York and the latter suggested the establishment of an apprenticeship system on the Santa Fe. Mr. Kendrick in turn took the question up with the superintendent of motive power and Mr. Purcell was asked to accept the position of supervisor of apprentices. He felt that he did not care to get out of the actual shop management and Mr. Thomas, present supervisor of apprentices, was put in charge of the apprentice plan. How well he has executed this commission is known to all in the organization and to many outside of it.

If any one in this world ought to be happy the group before me ought to be, because there is no source of happiness to be compared with that of doing a lasting service for others. You are doing for the shop boys under your charge that which no one ever had the opportunity to do before. I wonder whether you .fully appreciate this and whether you occasionally stop to think of the possibilities and responsibilities of your position.

Human history reveals the fact that it is usually the boy who springs from humble sources upon whom the greatest responsibilities are placed and to whom the greatest possibilities are brought. You may have in your classes boys who are to take great positions and who are to become great leaders, who are to provide solutions for some of the most difficult problems that men were ever called upon to solve. Do you ever think of this? Do you occasionally stop to think of the possibilities of the inspirations which you may be able to put into the minds of those lads whose educational development is placed in your hands? Everything depends upon the quality and quantity of inspiration which a boy may acquire and it is your privilege in a large degree to inspire your boys with that which will lead them to become truly great men. Stevenson has said: "An inspiration is a joy for ever, a possession as solid as a landed estate, a fortune which we can never exhaust and which gives us year by year a revenue of pleasurable activity. To have many of these is to be spiritually rich."

I do not mean that it is necessary to be prominent in order to be great; a truly great man is one who completely fills the place in the world which his knowledge, capacity and ability fit him to fill. A great leader is successful only when the ranks of his followers are filled with men who themselves are great in the sense of completely filling the places for which they are fitted. Comparatively few leaders are required, but many trained followers are necessary to the success of any large undertaking. If you develop many good followers you will find that the problem of leadership solves itself.

We often hear of the lack of leaders, of foremen and superintendents. This is not our problem today. If we produce many good men from the ranks those having capacity for administration will reveal themselves automatically. They may not be kept down, they will stand out prominently and will take their proper places. Do not worry about them. Even if you should try to hold them back, they will force themselves to the front.

Conditions prevailing in the mechanical trades today concerning the recruiting of the ranks of skilled workmen present a problem which if not intelligently, consistently, persistently and quickly attacked will constitute a national menace, threatening a national calamity. It is impossible to make such a statement too strong to represent the actual conditions. It is the duty of those who understand and appreciate these conditions to leave no stone unturned in the search of ways and means of bringing the facts before those who are in position to improve the situation.

The stupendous growth of the automobile industry reveals the need of doing something to supply the demand for skilled mechanics. No reliable figures are available to show how many men that industry has taken from the older ones, but the number is very large. They have been taken by force, by sheer robbery with no approach to adequate means for supplying the deficiencies the process has left in the older lines of manufacture. The country can not long stand this drain, and others similar in character, if not in extent, without loss that will become irreparable if manufacturers and railroads do not soon wake up to the danger of the situation.

What is needed is apprenticeship—real apprenticeship—and that quickly: apprenticeship such as you are building up on the Atchison, Topeka & Santa Fe. But there must be vastly more of it. This and all other efforts of the kind today constitute a mere drop in the bucket compared with the general need. It may seem to you out of place to make those statements to you, but it is not. These things should be taken home by all of you to inspire you to even greater efforts than you ever have made, so that your work may bring results so positive, so big and so important to your organization as to attract the attention of hosts of others to the necessity of engaging in this great undertaking.

As a nation we manufacture everything else but workmen. We steal all the workmen we can from Europe. We make vast numbers of specialists who can do one single job fairly well, but we cannot steal enough from Europe. We can not make thoroughly skilled workmen from these specialists. We must do as a nation what you are doing as a railway, train a lot of fine young men whom we may safely trust honestly and correctly to manufacture the many things we need. This problem is training—trade training, combined with the intellectual development necessary to a clear understanding of the reasons for

doing the work as it must be done. No better expression of what is needed has ever come to my attention than that of the Massachusetts Commission on Industrial Training in a report made some years ago. Would that every railroad officer and every manufacturer could have this idea forced upon him. That commission said:

"The commission was told at almost every hearing that in many industries the processes of manufacture and construction are made more difficult and more expensive by a lack of skilled workmen. This lack is not chiefly a want of manual dexterity, though such a want is common, but a want of what may be called industrial intelligence.

"By this is meant mental power to see beyond the task which occupies the hands for the moment to the operations which have preceded and to those which will follow it; power to take in the whole process, knowledge of materials, ideas of cost, ideas of organization, business sense, and a conscience which recognizes obligations. Such intelligence is always discontented, not with its conditions but with its own limitations, and is wise enough to see that the more it has to give the more it will receive.

"Manufacturers confidently believe that a system of industrial education wisely planned would tend to develop such intelligence, while it increases technical skill."

Another quotation also should be forced home to the same people. This is from the head of one of the largest manufacturing organizations of the country. It was called forth by a criticism of workmanship and a suggestion of closer inspection of the work.

"There is no denying the fact that there is a constant tendency toward a lower order of skill on the part of our workmen, especially in the machine shop. A first-class mechanic seldom, if ever, applies for work and we have to make our men from raw material such as presents itself at the gates for employment, and I think the time has come when we should employ instructors rather than inspectors in some of the departments. In any event, the matter of maintaining a maximum of efficiency among our mechanics is becoming a very serious one, and while a rigid system of inspection is a step in the right direction, it does not get at the root of the evil."

Hugh Chalmers, whose name is famous in the automobile field, has said: "We have five ever present problems—materials, management, money, merchandise and men. Of these the last is the most elusive."

In engineering we first familiarize ourselves with materials and then with forces. Do we do the same with men? Do we try to fit men to their places as we do materials and forces? Does any manufacturer or any railroad know about men as about materials? What do you think would happen if we studied man as we study metals, mechanics and engineering, if we knew their characteristics, their abilities and their possibilities? We do not analyze men as we do metals. We guess at their abilities to fill certain places and to do certain things. We often guess wrong and yet it is not necessary to guess at all. We cannot measure capacities or capabilities of boys by looking at them. We must develop more scientific and more thorough methods.

Without doubt the most important message in my power to bring you is that of the importance of studying the characters and abilities of your boys in order that you may not be working with them blindly. No greater criticism of our entire educational system may be made than that it treats its raw material in classes without individual study of each member of the class, and yet there are no greater differences than those between the personal characteristics of individuals. You know perfectly well that you will fail if you attempt to teach classes. You must teach individuals. I desire to bring before you the plan which seems to me to reveal the best path to follow in educational work or in the development of an organization, which is the problem you are engaged in solving.

Before he left railroad service LeGrand Parish introduced a plan for the study of men.* It contains elements worthy of most careful study with special reference to the problems before you. Mr. Parish worked out his scheme in order to secure information which would enable him to make promotions in his organization with intelligence. It is presented to you in order to show you the value of studies of personal characteristics in your educational work.

Cards, similar to the one shown, were used:

Name .....
Employed at .....
As .....

	Very Good	Good	Medium	Poor
Education				
Special knowledge				
Experience				
Honesty				
Morality				
Temperance				
Tact				
Resource				
Reliance				
Foresight				
Appearance				
Memory				
Energy				
Initiative				
Persistence				
Assertiveness				
Discipline				
Promptness				
Accuracy				
System				
Organization				
Executive ability				

Signature.....
Date .....

These were issued to officials with instructions that they be filled out concerning subordinate officials. These subordinate officials were required to fill out other cards for the men under them. The cards were issued in sufficient numbers exactly to fill the requirements so that there would be no surplus. No one could keep a copy of any card. In this way the records would be made twice a year, the cards going to Mr. Parish personally for study and for record and for use in improving his organization. Two things were accomplished. First, the head of the department had a record of the opinion of every man by the officer over him; second, the officers were made to study their subordinates and their opinions of those subordinates were checked every six months. Those who made progress and those who did not received the attention that the organization required.

Suppose you put into effect such a study of your boys. Suppose you compare your own opinion with that of the foreman in every case by having the shop foreman make out the cards as well as yourselves, and then suppose you work with every boy to strengthen his weak points, or perhaps you will change his work or his surroundings as a result of this study. Do you not see how much better you could lead them vocationally and educationally? This is being done at the University of Cincinnati by Dean Schneider, with wonderful results.

Consider for a moment the eight hundred boys under your charge. No two of those boys are alike. Their personal characteristics, however, may be classified to a certain extent and these characteristics may be studied with a view of guiding them into that particular field of work for which they are best fitted. The variety of work in railroad shops is great and, therefore,

*American Engineer and Railroad Journal, December, 1908, page 459.

offers remarkable opportunities for providing for widely varying abilities. You have about 20 different kinds of work in the shop offering opportunities to provide for many kinds of boys who are mechanically inclined. Not all your boys are mechanically inclined. Some of them should be in the clerical or in other lines of effort. The various divisions of railroad work should be studied and the personal characteristics necessary for success in each should be established. Then by knowing the characteristics of the boys you may direct them into their proper places with intelligence.

For instance, suppose you know the requirements for the boilermaker, the machinist, pattern maker, pipe fitter, tinsmith, copper smith, erecting shop man, powerhouse engineer, and all other shop department men, and suppose you know the requirements of the locomotive fireman, engineer, brakeman, roundhouse man, the clerk and office man. Suppose you know the characteristics of your boys, you will then be in position to know just what to do with each and every boy and will be able to put each and every one into his particular element.

These personal characteristics listed by Mr. Parish will place a patient plodder, having little initiative, in work which requires frequent repetition of the same task. Then it is a question of manual skill which decides what that task shall be. These boys like to have a task given them which they fully understand. Boys who like responsibility desire a task which they do not fully understand, which involves thought and study as to methods. They are impatient of routine, ambitious to do new things and try new methods. They enjoy a problem and wish to be given one to work out without being told how to do it. In the erecting shop or in the millwright department, perhaps later in the drafting room or test department, these boys will find their greatest opportunity. Others show aptitude in directing the work of others. There are numerous opportunities for them in almost every department.

Time will not permit me to go further into detail in this direction, but this problem of placing the boy in his particular element is, as I see it, the greatest one before you. Let me ask you how you yourselves would have profited by such a plan as this? We usually drift from one line of work to another, losing much time, perhaps years, because no one studies and directs us in such a way as this. How many of us have struggled for several years in a job and have had to be "fired" in order to get us out of a line which we had no business to be in! I maintain that you do not need to "fire" anybody who is willing to work. You may discharge a boy for incompetence in the shop and wake up some day to see him president of the road. This may happen simply because you do not study your boy and because you do not discover inherent ability of a kind different from that which you expect to find. This remark is made to give point to the argument, but to find the future president is not your problem. Your problem is to fill the ranks with men qualified to fill them. You have the material and you also have the responsibility of using it.

It is only when we are doing that which we are fitted for and are intended to do that we succeed and are happy. If we are misfits we are sure to be unsuccessful and unhappy. Perhaps you may not have thought of the possibilities of this kind of individual character study. Perhaps you may not have considered this a part of your opportunity and responsibility.

Tomorrow—Who is thinking about tomorrow? As we understand this word and as we prepare for tomorrow, are we to be judged as to the justification of our being on earth. We are now facing social problems more difficult and more complicated than those of the past, and with more at stake than ever was at stake before. Here we have the labor problem, that of the relations between capital and labor. Are we doing out part to solve it? Who is doing anything permanently to improve it? Are we to leave the solution to selfish interests of some kind?

There must always be a large element of unintelligent labor ready to follow the leader who talks the loudest and talks the most. From these the unthinking majority of the ranks of labor are and will be recruited. But, there is, and will be, the thinking minority in position largely to control the majority. To these we must look for the solution of labor questions from the labor side. These may be trusted to think and to think straight on this difficult subject. Nothing is to be feared from them, but great and good influence is to be expected from them.

While delayed too long already, there is yet time greatly to increase the proportion of the thinking workers and to contribute in a large way to the improvement of the situation. I do not mean that employers should engage in the business of teaching their side of the question to the workers. I mean that those of the workers, who are to be thinkers should be discovered and should be shown how to think straight.

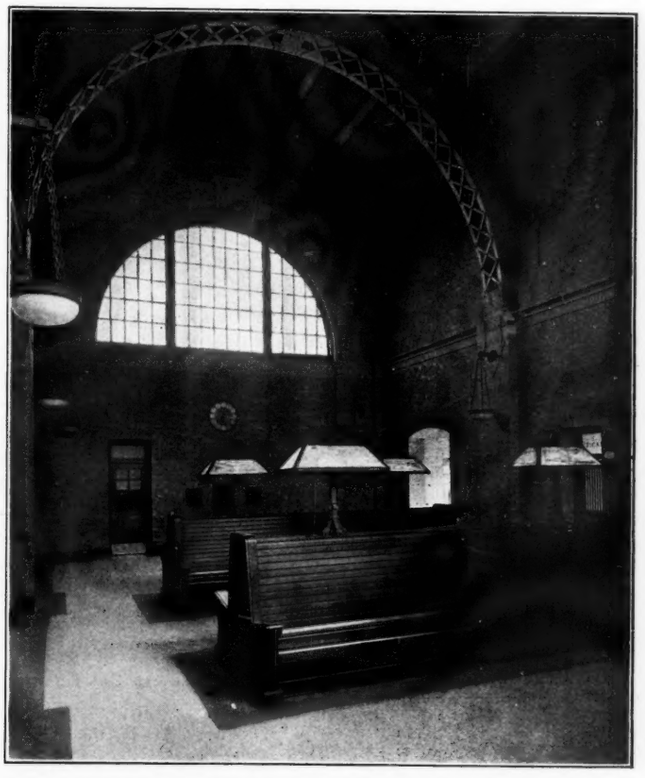
Employers must look to their recruiting systems. Most of them have no system. They take such men as they can secure and then try to fit square pegs into round holes. No wonder that employers and employees are both dissatisfied. Employers must establish apprenticeship, provide training of the hands and must in some way see to it, that the educational development of the mind goes side by side with the training of the hand. One thing more remains. Employers must know their employees. Then the organization must be one in which good men will like to work.

Apprenticeship is on trial. There is much at stake in your enterprise on the Santa Fe. Show by the great success which you will attain that other large organizations must do the same if they would succeed as you are succeeding.

NEW MONTCLAIR STATION OF THE DELAWARE, LACKAWANNA & WESTERN.

The Lackawanna has just completed new freight and passenger terminals at Montclair, N. J., involving the expenditure of approximately $500,000.

The passenger station was opened on Saturday, June 28. This station is built in the Grecian Doric style of architecture open-



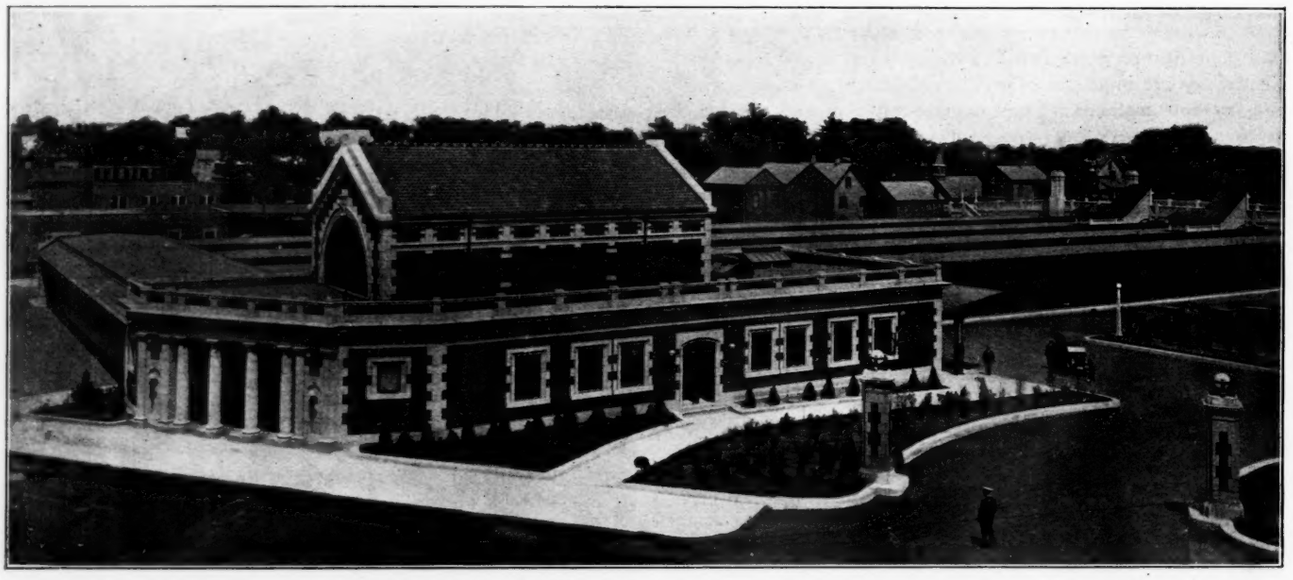
Interior of Waiting Room, Montclair Station.

ing through a colonnade into a loggia leading directly to the main waiting room and train concourse. The walls are faced with tapestry brick trimmed with marble chip concrete. The roof over the main waiting room is of green glazed tile, while that over the lower portion of the building is of red quarry tile, the same material being used for the floor of the loggia.

The walls of the main waiting room are faced with buff colored pressed brick broken with pilasters and a molded belt course 16 ft. above the floor line. This belt course and the molded brick surrounding the large semi-circular arched windows at each end of the main waiting room are gray in color. The floor is of marble chip terrazzo, harmonizing in color with the walls.

Particular attention has been paid to the ventilation, which is secured by register faces concealed by the trusses and by ventilated ridge tile directly connected through the roof beams with concealed openings in the purlins along the side walls. Illumination is secured by two large semi-circular windows in the ends of the waiting room, while artificial lighting is provided by eight semi-indirect hanging side lamps and four lamps placed on the seats.

Two ticket windows are provided in the side wall of the main waiting room directly opposite the main doors leading to the track concourse. The hand baggage and parcel room is placed at one end of the main waiting room, while men's smoking room, ladies' rest rooms and toilets are located conveniently.



General View of Montclair Station and Trainshed.

The heating of the building is provided for by a boiler plant about 800 ft. from the station, connected with the station by a 4 ft. x 5 ft. reinforced concrete conduit in which the pipes are placed. Telegraph and telephone lines and all electric lighting wires are placed in a separate conduit built into the walls of the steam pipe conduit.

Four platforms are provided, serving six tracks, each platform being 17 ft. wide and 650 ft. long, covered with reinforced concrete canopies for about 350 ft. The entrances to the driveways leading to the station are flanked by gate posts built of tapestry brick and surmounted by electric light fixtures of hammered copper. The driveways and all flower beds are curbed with concrete and the driveways are paved with creosoted wood blocks.

Railway to Tequendama Falls, Colombia.—As the Colombian congress has authorized the president to extend the Southern Railway to the falls of Tequendama river, a decree has been issued for carrying out the extension by the railway administration. The entire net income of the Southern Railway will be used for completing this work.

FREIGHT RATE ADVANCES AND THE INTERSTATE COMMERCE COMMISSION.

The opinion by the commission is in full as follows:

In the summer of 1910 carriers operating in official classification territory filed with this commission schedules making general advances in freight rates. These tariffs were suspended by the commission and an investigation begun.

The carriers attempted to justify the advance on the ground that owing to increase in wages and other operating costs the then rates of transportation did not yield a sufficient revenue. After full consideration the commission held, in February, 1911, that the advances had not been justified, 20 I. C. C., 243, and in announcing its opinion the commission said that if actual results were less favorable than then appeared probable the carriers might again bring this matter to its attention.

The Baltimore & Ohio, the Erie, the New York Central Lines, and the Pennsylvania Railroad system now petition the commission to reopen the case and proceed with its further consideration. They base this petition upon the ground that the cost of conducting their business has exceeded the forecast of the commission so that the results are much less favorable than had been anticipated. They assert that today, owing to increased costs of operation of various kinds set out in the petition, the net return is no longer sufficient.

The tariffs which were suspended in the original case advanced class rates and certain commodity rates; the suggestion of this petition is that instead of advancing particular rates there should be a general increase of 5 per cent. in all freight rates.

In view of the allegations of this petition the commission is of the opinion that the question of the need of and justification for additional revenue should be further examined by it at the present time. We think, however, that such examination can be made more satisfactorily and more comprehensively in a general proceeding of investigation instituted by the commission upon its own motion than by a further consideration of this particular record. We have therefore determined to deny the petition for a rehearing and have instituted a proceeding of inquiry into the following matters:

(*a*) Do the present rates of transportation yield to common carriers by railroad operating in official classification territory adequate revenues?

(*b*) If not, what general course may carriers pursue to meet the situation?

In this connection the commission makes two observations:

First. The fact that we have decided to further investigate

this subject must not be taken as an intimation that the commission has reached the conclusion that revenues are inadequate or that rates should be advanced. Upon this question no opinion has been formed.

Second. That the statute gives to any party the right to attack by complaint any rate, and no general conclusion which the commission may reach and announce in this investigation can affect that right.

Upon the hearing of the proceeding of investigation appropriate reference to the former record in this case will be permitted.

Commissioner Clements, dissenting:

The law leaves to the carriers the initiation of their rates, subject to review and correction by the commission upon complaint, or upon inquiry instituted by it on its own motion, and full hearing, with power in dealing with the amount thereof to prescribe for the future only reasonable maximum rates. Nowhere in the law is the commission authorized to fix absolute or minimum rates. It is authorized to suspend pending investigation rates proposed by the carriers, before they become effective, only when such proposed rates have been filed pursuant to the requirements of section 6 of the act, the provisions of which demand specific statement of the rates proposed and that they be filed with the commission and posted at stations of the carriers.

It is not contended that upon a general inquiry by the commission, such as is here instituted, it could enter any order requiring or authorizing an increase of rates; yet this is a proceeding for the avowed purpose, among other things, of inquiring whether the present rates of the carriers afford adequate revenue. In my view any expression of opinion on this question, following a general inquiry of this kind not based upon specifically proposed rates filed according to law, involves a determination of some of the most fundamental and important questions respecting the reasonableness of rates not before us and contemplates the possibility of giving some sort of general sanction to advanced rates to be thereafter filed by the carriers.

Of necessity it follows that, notwithstanding the recognized right of shippers to protest against such proposed increased rates as might in consequence thereafter be filed, the matters that will necessarily be involved upon the filing of such rates and protests will in a measure have been predetermined. This I cannot believe is within the contemplation of the law or was in the mind of Congress when it was enacted.

Commissioner Marble:

I agree that the petition for rehearing should be denied but cannot agree that the investigation should be made in advance of the posting of the proposed increases.

The petition should be denied because no proposed increased rates are now posted at the stations. On a further hearing of the former proceeding, therefore, the questions to be considered would be merely general, and shippers would not be afforded that specific detailed notice of the proposed new rates contemplated by the act to regulate commerce. The posting of such rates is not a merely technical form, but a necessary preliminary to a precise understanding of them by those to be affected. No conclusion that an increase has been justified in any respect whatever should be reached until after shippers have been given the notice provided by law and so called upon to state their views and objections. The commission has no jurisdiction to make rates in the first instance, to direct increases in rates, or to approve rates in advance of posting and filing.

The dissent is based upon the view that the subject matter of the investigation is the propriety of increases in rates and that the above considerations apply to it also.

Commissioner McChord:

While I agree to the general propositions stated by Commissioners Marble and Clements, yet I am of the opinion that it is our duty to make this investigation.

The act to regulate commerce, among other things, provides:

That the commission hereby created shall have authority to inquire into the management of the business of all common carriers subject to the provisions of this act and shall keep itself informed as to the manner and method in which the same is conducted and shall have the right to obtain from such common carriers full and complete information necessary to enable the commission to perform the duties and carry out the objects for which it was created; and the commission is hereby authorized and required to execute and enforce the provisions of this act. . . . The Interstate Commerce Commission shall have full authority and power at any time to institute an inquiry, on its own motion, in any case and as to any matter or thing concerning which a complaint is authorized to be made, to or before said commission by any provision of this act, or concerning which any question may arise under any of the provisions of this act, or relating to the enforcement of any of the provisions of this act.

In their petition requesting this investigation the carriers say:

Your petitioners are prepared to show that the cost of conducting the business of the carriers has been, and is being, steadily increased by increases in capital charges; increases in wages; increases in taxes; increased burdens imposed by legislative enactment, such as extra-crew laws, employers' liability and compensation acts; elimination of grade crossings either in part or in whole at the expense of the carriers; the installation of various appliances; and in various other respects.

Your petitioners further allege that existing rates are insufficient to afford just and reasonable compensation and return to the carriers and are unreasonably low in view of the value of the service afforded thereunder.

Your petitioners are prepared to show that they should expend large sums of money, aggregating many millions of dollars, for many purposes, among which are enlargements of yards and terminals, additional tracks, block signals, additional shops, improvements in stations, changes and eliminations of grade crossings, new locomotives, new passenger and freight cars, and other equipment; that these large expenditures of money are demanded by existing and future transportation conditions, and must be made if your petitioners are to satisfy the needs of the public for improved and additional facilities.

Your petitioners are further prepared to show that the large sums of money needed for these improvements must be largely provided by the issuance of new securities, and that such necessary capital can not, under existing transportation rates, be obtained except on terms which would be prohibitive or which the carriers generally would not be justified in assuming. The net earnings produced by existing rates are not sufficiently large to furnish that margin of surplus which will afford the carriers the credit necessary to enable them to secure the additional capital required for such necessary purposes, and it is only through an increase in freight rates that this can be accomplished.

These questions are undoubtedly important, and their investigation will at least be a step in the direction of the commission's keeping itself informed. I think we should brush aside all technicalities and take advantage of the opportunity to go into all these matters thoroughly; as to what shall be said or done after the commission has been fully advised is a question reserved for future determination. The order of investigation should issue. (27 I. C. C., 384.)

ORDER.

A petition for rehearing having been filed in No. 3400, In the Matter of Advances in Rates by Carriers in Official Classification Territory, praying that that case may be reopened and further considered upon the ground that operating costs have so increased since the rendition of the decision that rates of transportation are now sufficient; and the commission being of the opinion from a consideration of the allegations of that petition that the need of and justification for additional revenue should be at the present time further examined, but that such examination can be best conducted in a proceeding instituted by the commission itself,

It is thereupon ordered that a proceeding of inquiry be instituted into the following matters:

First. Do the present rates of transportation yield adequate revenues to common carriers by railroad operating in official classification territory?

Second. If not, what general course may carriers pursue to meet the situation?

It is further ordered that in the prosecution of this inquiry opportunity shall be afforded to interested carriers and to the public generally to present such facts and arguments as may be desired; that common carriers by railroad operating in official classification territory are hereby made parties to this proceeding and shall be served with notice thereof, and that subsequent notice shall be given to them and to the public generally of such hearings as may be had.

THE UNION PACIFIC PLAN AS APPROVED.

The Decree of the United States Circuit Court in the Dissolution Case Has Been Filed Approving the Directors' Latest Plan.

The final decree of the court in the Union Pacific-Southern Pacific is as follows:

Section 1. The amended plan is hereby approved in so far, and only so far, as its provisions are embodied in this decree.

Section 2. Defendants having asked permission to exchange 382,924 shares of Southern Pacific stock for 425,472 shares of Baltimore & Ohio stock owned by the Pennsylvania Railroad Company, and it appearing that such exchange would be a substantial step toward the effectual dissolution of the particular combination now before the court it is hereby approved and leave is granted to effect the same: provided, however, that neither such approval and leave or anything contained in this decree shall ever be taken or construed as affecting the obligations, rights or duties under present or future laws of any person or corporation not a party to this clause, nor be taken or construed as an adjudication that any defendant herein has the right to acquire or hold the shares of stock so sold or exchanged, nor as exemption of any defendant in respect of such acquisition or holding from the operation of any law now in force, or which may hereafter be enacted.

In the event of such sale immediate delivery shall be made of the said 382,924 shares of the Southern Pacific, which is hereby directed to have them transferred on its stock books to the Pennsylvania Railroad, and thereupon to pay to the defendant Oregon Short Line Company, on demand, the dividends appertaining to said shares heretofore declared and payable April 1 and July 1, respectively, and the transaction shall be reported to the court within thirty days from the date hereof.

Section 3. The Central Trust Company of New York, hereinafter called the trustee, is made a party hereto, and is hereby appointed to receive and hold as the custodian and depositary of this court, subject to the provisions of this decree and to the further orders and decrees of the court herein, all shares of the stock of the Southern Pacific Company which shall be transferred to it as hereinafter provided.

Section 4. The shares of the Southern Pacific held by the Oregon Short Line remaining after above exchange with the Pennsylvania, to wit, 883,576 shares, or the entire holdings if such exchange with the Pennsylvania shall not be consummated within thirty days from date hereof, shall be transferred forthwith to the trustee and registered in its name on the books of the Southern Pacific.

The defendants Union Pacific and Oregon Short Line shall assign to the trustee all dividends appertaining to the shares so transferred which shall have been declared and shall be then or thereafter payable to the defendant Oregon Short Line, or the individuals holding in its behalf as the registered stockholders entitled to such dividends. Such dividends, hereinafter designated as the accumulated dividends, shall be collected by the trustee and held and distributed on the terms and conditions hereinafter provided.

Section 5. Prior to November 1, 1913, the defendants Union Pacific and Oregon Short Line shall offer to all stockholders of the former, common and preferred, registered as such on a date to be designated in the offer and not more than forty days from its date, or to their assignees, the right to subscribe for certificates of interest representing the Southern Pacific shares transferred to the trustee, substantially in the proportion of their respective holdings, with allowance for possible conversion of bonds. The offering shall include all accumulated dividends, appertaining to said shares, and shall be at such price and upon such other terms as the Union Pacific shall determine, except as herein specifically prescribed or as otherwise directed by the court by a subsequent order or decree.

The subscription shall be payable at the time of the subscription or at the option of the subscriber, $25 per share at the time of the subscription and the balance within one year thereafter with interest at 6 per cent.

Neither the Union Pacific or the Oregon Short Line, or any corporation controlled by either, or any person acting in the interest of either, shall acquire by purchase or otherwise any of said certificates of interest.

The defendants, Union Pacific and Oregon Short Line, may cause the sale of said certificates of interest upon such subscription offer to be underwritten.

Section 6. The trustee shall execute and issue certificates of interest representing the shares transferred hereunder and shall deliver them at its office in the city of New York to the subscribers thereof upon payment in full of the subscription price, etc.

Section 7. [Refers to issuance of trustee by part payment subscription receipts.]

Section 8. The certificates of interest and the subscription receipts issued hereunder may be in the denominations of 1 share, 10 shares, 50 shares, 100 shares and such other denominations as the trustee shall elect.

Section 9. The trustee shall, if so requested by the registered owner of any subscription receipt, by application in writing not less than 10 days prior to any annual or stockholders' meeting of the Southern Pacific, execute and deliver to such registered owner a proxy appointing such proxies as he shall nominate to appear and vote at such meetings.

Provided, however, that as a condition precedent to the issue of such proxy the applicant shall file with the trustee an affidavit that he is not the holder of any shares in the Union Pacific.

Section 10. So long as any share of the capital stock of the Southern Pacific shall be held by the trustee, the trustee shall collect and receive all cash dividends declared by the Southern Pacific appertaining to the shares so held. Upon the conversion of any certificate of interest into shares of Southern Pacific stock the latter shall pay in cash to the owner of the certificate converted the amount of all cash dividends collected by it, including the aforesaid accumulated dividends, appertaining to the shares represented by such certificate of interest. Any interest realized or allowed by the trustee upon funds paid to it as dividends shall be applicable to the payment of the compensation of the trustee and expenses, and any balance shall be paid to the Oregon Short Line unless otherwise ordered.

Section 11. At any time, upon demand, upon surrender of any outstanding certificate of interest by the registered owner, the trustee shall deliver to him, stock certificates for the number of shares of Southern Pacific represented, upon condition, however, that the applicant for such conversion shall file with the trustee duly executed affidavit in one of the forms annexed.

[The affidavits referred to are to the effect that the holder who desires to convert his certificates into Southern Pacific stock holds no shares of the Union Pacific Company.]

All dividends payable, otherwise than in cash, which shall be declared by the Southern Pacific shall be received and held by the trustee for the pro rata benefit of such registered owners upon the same terms and conditions as the shares originally deposited.

Provided, however, that whenever the number of shares of Southern Pacific stock held by the trustees shall be reduced to 500 shares they shall be distributed pro rata among the registered owners of the then outstanding certificates of interest.

Within thirty days after conversion of certificates shall have commenced, and at monthly intervals thereafter, the trustee shall file with the court a report showing the aggregate amount con-

verted since the last previous report and the names of all persons to whom Southern Pacific stock shall have been issued pursuant to every such conversion involving more than 100 shares; and from time to time at the request of the attorney-general the trustee shall furnish him with any information he shall require relative to the carrying out of this decree.

Section 16. Nothing in this decree shall be construed as prohibiting the Union Pacific from acquiring at any time the capital stock or other property of the Central Pacific.

Section 18. The trustee is hereby authorized to treat all funds on deposit hereunder as general deposits and to allow interests thereon. L. C. Krauthoff, of New York City, is appointed commissioner for the court to see to it that the letter and spirit of this plan of dissolution is carried out and is directed to report to the court from time to time.

* * *

In his response to the petition, the attorney-general gives these reasons for approving the exchange plan for the disposal of $38,000,000 of the stock:

The proposed sale to the Pennsylvania Railroad of 382,924 shares of the capital stock of the Southern Pacific now owned or controlled by the Union Pacific in exchange for 425,472 shares of the capital stock of the Baltimore & Ohio Railroad, now owned by the Pennsylvania, obviously goes far to separate the Southern Pacific from the Union Pacific, and to that extent breaks up the particular unlawful combination between them asasiled in the original bill. Moreover, it divests the Pennsylvania Railroad of a large amount of the capital stock of an active competitor and thereby remedies a highly objectionable condition. So far as I am able to ascertain such exchange would not result in creating any new combination in restraint of trade, nor any other condition in violation of existing law.

The attorney-general, however, qualifies his approval of the exchange plan with the suggestion that a proviso be added specifically reserving to the government the right to bring action against the combination between the Pennsylvania and the Southern Pacific, or that between the Union Pacific and the Baltimore & Ohio should it appear in the future that any illegal condition, not now anticipated, had resulted from the transactions described; and to Congress the power to enact legislation which may affect these combinations.

Justifying this reservation, the attorney-general says in his response:

"While the lines of the Pennsylvania system appear to be non-competitive with those of the Southern Pacific and the lines of the Union Pacific non-competitive with those of the Baltimore & Ohio, it is manifest that the Pennsylvania lines and the Southern Pacific lines do not connect so as to form a continuous route, nor do those of the Union Pacific and the Baltimore & Ohio.

"Furthermore, while at present no federal law forbids a railroad company from owning stock in another non-competitive line, Congress may hereafter deem it advisable to change the national policy in that regard, and the courts may interpret existing laws so as to give them meanings different from those now accepted.

"Wherefore . . . said exchange should only be permitted subject to the following express condition, in substance:

"That such permission shall not be taken or construed as affecting the obligations, powers, rights, or duties under either present or future laws of any person or corporation not a party to this cause, nor be taken or construed as an adjudication that any party hereto has the right to acquire or hold the shares of stocks so sold or exchanged, nor as an exemption of any such party in respect of such acquisition or holding, from the operation of any law now in force or which may hereafter be enacted.

"Not only would this proviso leave unobstructed the power of Congress hereafter to legislate in respect of the stocks or transactions in question, but if any illegal condition should result from the proposed exchange of stocks under existing law the government would freely assail it, if so advised."

Approving those sections of the petition which provide for the disposal under a trusteeship of the remaining $88,000,000 the attorney-general says in his response:

"These provisions put the disposition of such shares under the direction of the court. The trustee has no power to vote the shares except when and as directed by the court. The holders will have no voting rights and will receive no dividends until their certificates are converted into stock of the Southern Pacific, and such comparison can only be made upon affidavit that the applicant owns no shares of the Union Pacific, and is not acting for or on behalf of any stockholder thereof. Further, the holders of such certificates can receive no interest on the dividends collected and held by the trustee.

"At monthly intervals the trustee is required to report to the court the names of all persons, firms or corporations who shall have converted such certificates into shares of stock of the Southern Pacific where the conversions involved more than 100 shares and the attorney-general may require of the trustee any other information relating to the carrying out of the plan.

"These provisions seem well designed to bring about a distribution of the shares of the Southern Pacific unlawfully acquired and controlled by the Union Pacific among persons not stockholders of the latter and thus effectually dissolve the unlawful combination. If they unexpectedly fail the disposition of the stock will remain subject to the further order of the court."

POWDERED FUEL FOR LOCOMOTIVES.

By WALTER D. WOOD.*

Everywhere the demand is for more motive power; every day the problem of smoke is becoming more urgent, and we have about come to a standstill in the development of our steam power. The railroads have been forced to electrify in the large cities; even Chicago, which has held out so long, has about forced the issue to a head, and electrification must come unless smoke is abolished—not partly, but entirely. All sorts of means and devices have been tried to this end, including stokers, so-called smoke consumers, fire brick arches and coal in different forms (coke, briquettes, etc.). Coke is smokeless, but impracticable for reasons of space, cost and low volatile qualities.

Outside of the cities on our big Mallets it has become a question of consistent performance and extra firemen. Practically all of the biggest Mallets have, or have had, stokers of various types at some time or other, most of them having proved inadequate when the most trying conditions were imposed upon them; in some cases they have been taken out entirely and hand firing resorted to, which usually means two firemen and extra expense.

For many years coal in powdered form has been used very successfully and economically in cement mills throughout the country and in several metallurgical furnaces and wrought iron concerns. In the cement mills it replaced oil, proving far cheaper than the liquid, even when the cost of drying and pulverizing is taken into consideration. Besides being from one-third to one-half cheaper than burning coal in the regular form, it is absolutely smokeless. Both of these things recommend it at once for use on locomotives. This appealed to the officers of several roads as long as ten or twelve years ago, and several of them have even gone to the trouble of equipping locomotives experimentally for trying out this method, and each in turn has failed from one cause or another. The purpose of this article is to analyze these trials and show wherein the trouble lies, and in most cases point out the remedy.

The biggest mistake that was made in nearly all the experiments was to try to puiverize the coal on the engine itself. This has proved time and again to be impracticable even in stationary plants where everything was favorable for the best results. The reason this cannot be done is because there is no way of drying

*Altoona, Pa.

the coal, and again the amount of coal pulverized per second, or minute, by any form of pulverizer, is so variable, according to the size, hardness and amount of moisture that happens to constitute any lump of coal fed the machine, that it is impossible to regulate the supply of air and coal in proportion to suit the varying rate of production. Again, this system limits a flexible supply; in other words a sudden call for fuel (when the engine strikes a grade) cannot be met unless the entire workings of the pulverizer are changed to increase the output one minute and decrease it the next, and this is out of the question. The only practical way to burn powdered coal on a locomotive is to carry it powdered in an air-tight tank, the same as sand is carried in the sand box, and draw it off as needed at the bottom by a screw conveyor or other means.

Another common mistake that was made almost without exception was to blow the coal dust into the firebox with considerable velocity. A locomotive firebox is one thing and a cement kiln is another. The latter is a cylinder 140 ft. long and 8 ft. in diameter. Some concerns blow their coal dust in with 60 to 80 lbs. of air per square inch; most of them use from 6 to 9 ozs. The heat generated by a pulverized coal flame is from 3,000 deg. to 4,000 deg. F.; add to this a high velocity and you have a blow pipe effect that will destroy fire brick and make it run like molten glass. (This temperature, however, can be reduced 800 deg. to 1,000 deg. by using excess air.) This is not so much the effect of the heat as it is of the flame impinging directly against the fire brick.

In the cement kilns the fire brick lasts for months, because the path of the flame and gases is not interrupted, but they can travel straight through and out. In bricked up fireboxes where it has been tried it has sometimes broken down the arch in a few hours. A western road experimenting recently had the beading on the ends of the flues badly burned. In all cases the fault was the same—high velocity. True, to make our boilers steam we must of necessity bring gases containing a certain number of heat units in contact with the walls of their flues. This in turn demands that we must develop this number of heat units every second in the firebox, which in turn compels us to introduce and consume a certain number of pounds of coal per hour in order to liberate this heat. This would be easy if it were not for the fact that we have to supply 150 cu. ft. of air for every pound of coal consumed, and in our big Mallets, where as high as 10,000 lbs. of coal per hour are sometimes required, it means that we must have high velocity to supply this air or else provide an enormous area of supply. In nearly all cases heretofore the practice has been to close up the firebox entirely, including the grate area, and supply all the air through one or two small nozzles about 6 in. in diameter by means of a blower, the coal going in the same way and impinging with terrific velocity in a half consumed state against the fire brick, or whatever else opposed its progress. I say half consumed, because it has not had time to become ignited from the heat of the surrounding walls. The only way to burn it properly and thoroughly at the same time is to blow it into the firebox with only enough air to float it or make a dust cloud (about 1 or 2 lbs. of air per pound of coal is sufficient). The other 12 lbs. of air are supplied by natural induced draft alone, the same as when burning coal on the grate.

Another detail of construction that this method entails is the use of what I call a "duplex" nozzle, or a nozzle within a nozzle, the small inner one supplying the coal dust with just enough air to carry it in, and the larger surrounding one supplying the necessary air for combustion at a pressure so low that the exhaust of the locomotive will create a high vacuum in the firebox. This double nozzle is a proved success and is working every day in the year at a big iron and steel works in the East, producing by far the most flexible and economical feed in existence.

An ideal arrangement for a large locomotive is to have three nozzles, each the area of a fire door, placed just above the mud ring in the front of the firebox with adjustable air control from zero to full open, and directly below them in the grate surface three more auxiliary air openings, still larger and also having adjustable air control. By this system the entering velocity of the coal dust is reduced to a minimum, and it has time to expand and burn before it is carried into the tubes. When you take into consideration the fact that even in cement kilns where conditions are ideal and with only 8 ozs. of pressure, the coal is blown in 5 or 6 ft. before it ignites, we can see how absolutely essential it is to have a low entering velocity for use on locomotives where the firebox is so small in comparison.

It is well known that we must have fire brick and plenty of it to successfully convert the coal dust into CO_2, but at the same time it must be so constructed as to decrease the size of the firebox as little as possible, for of course the entering coal dust and air will expand in proportion to the difference in the outside temperature and the temperature of the firebox. When you take into consideration that a cubic inch of coal when finely powdered (90 per cent. through 200 mesh) offers about 20 sq. ft. of effective area for combustion, it can readily be seen that the area of the firebox is a big factor and unless we have one large enough to burn the rapidly expanding gas (for such it practically is) and draft enough to remove the products of combustion, we will have the gas forcing its way out of the front of the firebox and back through the nozzle, causing a series of puffs, or "back fires." This was actually the case in a series of tests run some years ago where it was tried to feed more coal than could be burned. With sufficient draft and air, however, the danger is nil.

Locomotive fireboxes have staybolts—hundreds of them. These must be inspected regularly; every week on some roads. This makes bricking up the walls of the firebox prohibitory—but we must have the fire brick. One possible solution is the Jacobs-Schupert or stayless type of firebox with its entire circumference bricked and a Scotch marine type of return boiler. The writer has worked up such a design, having the exhaust stack over the cab. This would leave the front end entirely free for unlimited superheater and feed water space, and would be a highly efficient boiler. One somewhat similar in design to this was tried out on the Manhattan Elevated Railroad some years ago and proved wonderfully efficient from the boiler end, but failed in the method of firing the powdered coal. Another alternative is the "tube firebox," i. e., a firebox constructed of tubes embedded in fire brick and connecting upper and lower water legs; also a well protected arch with double the number of tubes to keep it cool. This would go on in place of the present firebox and would take up the same amount of space, and the circulation would be enormous in comparison with the present type. The Scotch marine return tube design would also be carried out in this boiler. It has been proved by experiment and practice that pipes embedded in the brick will protect it. It may frit and chip off to a certain extent, but when the area of protection is reached it stops.

One other thing has caused a world of trouble and the failure of more than half the trials, and that is slag. In most tests where it was tried to get rid of it, it was found that although plastic when the furnace was in operation, it would cool before it could be gotten out. Brick doors and all sorts of schemes have been tried without success. The writer has devised a simple arrangement by means of which the slag is taken care of as fast as it is formed, doing away with all trouble of trying to rake it out, etc. Roughly it is to have the fire brick at the bottom slope toward the middle and one end and open at the center so that the slag will drop into a dumping pan of water and crystallize. It can then be dumped on the track or at the ash pit. The dumping pan can be filled with water from the injector overflow. The induced draft will allow the use of an open bottom firebox.

As to fineness; the coal should be 95 per cent. through a 100 mesh screen and 85 per cent. through a 200 mesh, and it should not contain over 5 per cent. of free moisture. The cost of pulverizing, drying and storing the coal is more than outbalanced by the many economies effected. There is a direct saving of

one-third of the coal through more perfect combustion, a saving by the abolition of ash pits and cleaning gangs, a direct saving in the ability to cut off the fire at will while standing in stations and on sidings, a saving in property values and paint on rolling stock through absence of smoke and cinders, etc. Added to all this is the wonderful flexibility of the fire, the supply of coal and air being increased or decreased at will by the turn of a valve. In switchers and other small engines a fireman would be superfluous. Coal, the analysis of which showed 50 per cent. of ash, has been burned by powdering it and blowing it in a furnace. This opens up for use a grade of coal which hitherto has been practically valueless. Powdered fuel is coming, and it is coming as sure as electrification came in New York and other cities. One of our largest locomotive companies at the present time is spending some $50,000 to adapt powdered fuel to locomotives.

TRAIN DESPATCHERS' CONVENTION.

The twenty-sixth annual convention of the Train Despatchers' Association of America was held at the Alexandria Hotel, Los Angeles, Cal., June 17, 18 and 19, President Kane presiding. The credentials committee reported 71 members present. The president in his annual address reported a gratifying addition to the membership during the past year. The resignations of eighteen members were received and eighty-one applications were presented for membership or reinstatement and favorably balloted upon.

F. R. Anderson, supervisor of signals for the Northern Pacific at Livingston, Mont., read a paper on "Advantages of the Telephone for Train Despatching," which developed considerable discussion.

On Wednesday the report of the executive committee was read and, with the president's address, was referred to a committee of three for consideration and further report.

The report of the executive committee showed income for the year $4,008, with increases as follows:

From dues	$631
From application fees	221
From bulletin subscriptions	314
From sundry receipts	4
Total	$1,170

Offset by expenditures amounting to $4,337.83.

The membership account showed a net increase during the year of 164 members, making the total membership of the association on the first of June 1,108. The 81 members elected and reinstated at this convention bring this total up to 1,189 members.

During the afternoon session of Wednesday brief addresses were made by H. V. Platt, general superintendent of the Southern Pacific; R. J. Clancy, assistant to general manager Southern Pacific; W. H. Whelan, superintendent Los Angeles division Southern Pacific, and J. H. Dyer, superintendent of the Tucson division of the Southern Pacific. These gentlemen made a special trip from Bakersfield in order to be present.

The report of the Train Rules Committee, consisting of a memorial address and submitted to the American Railway Association by the Joint Train Rules Committee of the Superintendents' and Train Despatchers' Associations, was taken up and discussed during the remainder of the Wednesday afternoon session, and resumed during the forenoon of Thursday. The recommendations on the various rules of the standard code were considered and discussed one by one, and with one or two exceptions were approved.

I. L. Hibbard, acting general manager of the Coast Lines of the Santa Fe; J. R. Hitchcock, acting general superintendent of the same lines; L. M. Jones, superintendent of telegraph of the Santa Fe lines, and Paul Burks, Los Angeles attorney for the Coast Lines of the Santa Fe, were present at the Thursday afternoon session, and each of them addressed the convention.

The final session of the convention was held on Thursday evening and officers for the next year were elected as follows: President, J. P. Finan (A. T. & S. F.), Needles, Cal.; vice-president, C. A. O'Connor (Boston & Albany), Springfield, Mass.; editor, J. F. Mackie, Chicago, Ill. (re-elected). Jacksonville, Fla., was selected as the next place of meeting, and the date fixed as June 16, 1914.

The program of entertainment was elaborate, and well arranged. There was an auto tour of Los Angeles and suburbs for all delegates and their ladies; a visit to the Cawston Ostrich Farm; a general get-acquainted meeting Monday evening; a theater party Tuesday, and a grand ball Wednesday evening, attended by 350 delegates and members of the local entertainment and arrangement committees, and by a large number of railway officers of Los Angeles. There were also trolley trips for ladies and various other things, but none was allowed to interfere with the conduct of the business of the convention. On Friday after the business was finished there was a complimentary trip, by the Southern Pacific and the Banning Company, to San Pedro and Catalina Island, and the party were entertained at luncheon by the Southern Pacific Company at the Hotel Metropole.

On Saturday there was a scenic trip around the famous kite-shaped track, which was complimentary by the Santa Fe. The delegates and their ladies were entertained at the celebrated Mission Inn at Riverside.

On invitation from the despatchers of San Francisco a party went to that city for the Monday and Tuesday following the convention. The San Francisco entertainment included the ascent of Mount Tamalpais.

The Los Angeles convention was voted the best attended and most interesting, instructive and altogether delightful convention in the history of the association. All were loud in praise of the hospitality of the despatchers and of the railway companies. The Santa Fe ran a special train of seven Pullman cars and a baggage car from Chicago for the delegates from the eastern and central part of the country, with a side trip from Williams to the Grand Canyon of the Colorado.

AMERICAN SOCIETY FOR TESTING MATERIALS.

The proceedings of the first session of the sixteenth annual meeting of the American Society for Testing Materials were reported in the *Railway Age Gazette* of June 27, 1913, page 1609. At the opening of the business session on Tuesday evening, June 24, Albert Sauveur presented a paper in which was proposed a recommended practice for the heat treatment of case-hardened carbon-steel objects. It was recommended that the following treatments be applied to case-hardened steel objects according to requirements:

When hardness of case only is desired and lack of toughness or even brittleness unimportant, the carburized articles may be quenched from the carburizing temperature, as for instance, by emptying the contents of the boxes in cold water or in oil. Both the core and the case are then coarsely crystalline.

In order to reduce the hardening stresses and to decrease the danger of distortion and cracking in the quenching bath, the articles may be removed from the box and allowed to cool before quenching to a temperature slightly exceeding the critical range of the case, namely, 1475 deg. to 1520 deg. F. Both the core and case remain coarsely crystalline.

To refine the case and increase its toughness the carburized articles should be allowed to cool slowly in the carburizing box within the furnace or outside to 1200 deg. F. or below, and should then be reheated to a temperature slightly exceeding the lower critical point of the case (in the majority of instances a temperature varying in accordance with the carbon content and thickness of the case between 1425 deg. and 1520 deg. F. will be suitable), and quenched in water, or, for greater toughness but less hardness, in oil. The objects should be removed from the quenching bath before their temperature has fallen below 212

deg. F. This treatment is more especially to be recommended when the carburizing temperature has not exceeded 1650 deg. F. It refines the case but not the core.

To refine both the core and the case and to increase their toughness the articles should be allowed to cool slowly from the carburizing temperature to 1200 deg. F. or below and should then be (*a*) reheated to a temperature exceeding the critical point of the core which will generally be some 1650 deg. F. to 1740 deg. F. followed by quenching in water or in oil; and (*b*) before they have cooled below 212 deg. F.[1] they should be reheated to a temperature slightly exceeding the lower critical point of the case (in the majority of instances a temperature varying in accordance with the carbon content and thickness of the case between 1425 deg. and 1520 deg. F. will be suitable), and again quenched in water or oil.

In order to reduce the hardening stresses created by quenching, the objects, as a final treatment, may be tempered by reheating them to a temperature not exceeding 212 deg. F.

There was no discussion.

STANDARD SPECIFICATIONS FOR STEEL.

In the report on the Standard Specifications for Steel there was included a report on a series of investigations on wrought steel wheels, conducted under the supervision of a committee, in which four wheels were tested to destruction. The details of these tests are given in the following tables which show the great resistance offered by them to the blows delivered by the drop.

TABLE I.

RESULTS OF TESTS.

Kind of Test.	Wheel. A	B	C	D	E	F	G	H
M. C. B. DROP.								
Number of Blows	12	12	12	12	....	....	....	....
Inspection	O. K.	O. K	O. K	O. K.	....	....	....	....
Number of Blows	18	18	18	18	....	....	....	....
Inspection	O. K	O K	O. K.	O. K.	....	....	....	....
THERMAL	....	....	....	....	Normal	Normal	Normal	Normal
Inspection	....	....	...	....	O K	O K	O K.	O. K.
DOUBLE THERMAL AND QUENCH[1]	....	....	....	....	....	....	....	....
Inspection	O. K	O. K.	O. K	O K	O. K	O. K.	O. K	O. K
M. C. B. DROP								
Number of Blows	12	12	12	12	12	12	12	12
Inspection	O. K.	O. K	O. K.	O K	O. K	O. K.	O. K.	O. K.
1640-LB. DROP.								
Deflection, in., after one blow each at								
5 ft. Hub	None	None	None	Broke	1/32	None	None	None
5 ft. Rim	None	None	None	....	None	None	None	None
10 ft. Hub	1/32	1/32	1/32	....	Broke	1/64	1/16	1/32
10 ft. Rim	None	None	1/32	....	....	None	1/32	1/32
15 ft. Hub	1/32	Broke	Broke	....	....	1/32	Broke	1/8
15 ft. Rim	1/32	....	....	....	....	None	....	1/32
20 ft. Hub	Broke	....	....	....	....	Broke	....	3/16
20 ft. Rim	....	....	....	....	....	....	....	1/16

DESCRIPTION OF WHEELS AFTER DESTRUCTION.

A.—Hub punched out. Rim intact. Plate shattered. No sign of previous fracture.

B.—Broke through rim on both sides about 150 deg. apart, crack extending around plate through punched hole and leaving hub attached to other side of plate. No sign of previous fracture.

C.—Hub punched out. Rim intact. No sign of previous fracture.

D.—Hub punched out. Rim intact. No sign of previous fracture.

E.—Hub punched out and plate shattered. Rim intact. No sign of previous fracture.

F.—Broke all around plate. Rim intact. No sign of previous fracture.

G.—Hub punched out. Rim intact. No sign of previous fracture.

H.—After blow at 10 ft. there was indication of crack in flange where cast iron had struck it in pouring, which crack, after blow at 20 ft., extended through rim on other side and part way around plate. Test stopped at this point.

[1] The objects should be removed from the quenching bath before they have cooled below 212 deg. F. in order to lessen the danger of cracking, and they should be placed in the reheating furnace while still at a temperature of at least 212 deg. F. likewise to lessen the danger of cracking, it being inadvisable (*a*) to allow steel to cool completely in the quenching bath and (*b*) to place hardened steel in a hot furnace. Obviously, if the furnace is cold the hardened steel may likewise be cold when placed in it for reheating.

The second wheel of each pair was subjected to the M. C. B. standard drop test. It was then examined for surface imperfections and subjected to 18 additional blows from the M. C. B. standard drop (200 lbs. falling 12 ft.). It was then examined for surface imperfections and subjected to the double thermal test and quenched. It was then subjected to the M. C. B. standard drop test, examined for surface imperfections, and tested to destruction with the 1640-lb. drop.

Tabulated results of these tests, together with the chemical analyses, are given in Tables I. and II.

TABLE II.

Wheel	Chemical Composition, per cent. C	Mn	P	Si	S	Ni	Cr	Cu
A	0.699	0.624	0.037	0.249	0.038	0.116	0.025	0.100
B	0.682	0.689	0.039	0.278	0.030	0.259	0.033	0.095
C	0.803	0.586	0.016	0.181	0.026	0.031	0.017	.....
D	0.717	0.750	0.021	0.209	0.033	0.038	0.037	.....
E	0.714	0.730	0.024	0.194	0.034	0.045	0.037	.....
F	0.681	0.663	0.034	0.292	0.045	0.132	0.016	0.135
G	0.734	0.708	0.030	0.163	0.028	0.047	0.015	.....
H	0.693	0.692	0.040	0.271	0.031	0.284	0.027	0.085

The following proposed new standard specifications for steel were also considered in the report:

MEDIUM-CARBON STEEL SPLICE BARS.

1. *Manufacture.*

1. The steel shall be made by the open-hearth process.

2. The splice bars may be punched, slotted and, in the case of special designs, shaped either hot or cold; but in the latter case they shall be subsequently annealed.

II. *Chemical Properties and Tests.*

3. The steel shall conform to the following requirements as to chemical composition:

Carbon .....not under 0.30 per cent.
Phosphorus .....not over 0.04 per cent.

4. An analysis to determine the percentages of carbon, manganese, phosphorus and sulphur shall be made by the manufacturer from a test ingot taken during the pouring of each melt, a copy of which shall be given to the purchaser or his representative. This analysis shall conform to the requirements specified in Section 3. Drillings for analysis shall be taken not less than ⅛ in. beneath the surface of the test ingot.

5. Analyses may be made by the purchaser from finished splice bars representing each melt, in which case an excess of

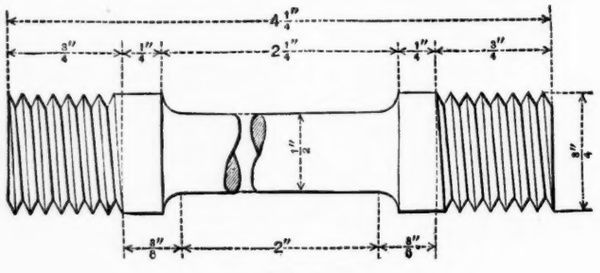


Fig. 1.

25 per cent. above the requirement as to phosphorus specified in Section 3 shall be allowed.

III. *Physical Properties and Tests.*

6. The splice bars shall conform to the following requirements as to tensile properties:

Tensile strength, lbs. per sq. in. (See Section 7.) .....68,000—83,000

Elongation in 2 in., min., per cent..... $\frac{1{,}600{,}000}{\text{Tens. str.}}$

7. The tensile strength may be over 83,000 to and including

85,000 lbs. per sq. in., provided that the elongation in 2 in. is not under 20 per cent.

8. The bend test specimen specified in Section 9 shall bend cold through 180 deg. around a pin the diameter of which is equal to twice the thickness of the specimen, without cracking on the outside of the bent portion.

9. Tension and bend test specimens shall be taken from the finished bars. Tension test specimens shall be of the form and dimensions shown in Fig. 1. Bend test specimens may be ½ in. square in section, or rectangular in section with two parallel faces as rolled.

10. If preferred by the manufacturer and approved by the purchaser, the following bend test may be substituted for that described in Section 8: A piece of the finished bar shall bend cold through 90 deg. around a pin the diameter of which is equal to twice the greatest thickness of the section, without cracking on the outside of the bent portion.

11. (*a*) One tension and one bend test shall be made from each melt.

(*b*) If any test specimen shows defective machining or develops flaws, or if a tension test specimen breaks outside the gage length, it may be discarded and another specimen substituted.

IV. *Workmanship and Finish.*

12. The splice bars shall be smoothly rolled, true to templet, and shall accurately fit the rails for which they are intended. The bars shall be sheared to length, and the punching and notching shall conform to the dimensions specified by the purchaser. A variation of 1/32 in. from the specified size and location of holes, and of ⅛ in. from the specified length of splice bar, will be permitted. Any variation from a straight line in a vertical plane shall be such as will make the bars high in the center. The maximum camber in either plane shall not exceed 1/16 in. in 24 in.

13. The finished splice bars shall be free from injurious defects and shall have a workmanlike finish.

V. *Marking.*

14. The name or brand of the manufacturer and the year of manufacture shall be rolled in raised letters and figures on the side of the rolled bars, and a portion of this marking shall appear on each finished splice bar.

VI. *Inspection and Rejection.*

15. The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the splice bars ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the splice bars are being furnished in accordance with these specifications. All tests (except check analyses) and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

16. (*a*) Unless otherwise specified, any rejection based on tests made in accordance with Section 5 shall be reported within five working days from the receipt of samples.

(*b*) Splice bars which show injurious defects subsequent to their acceptance at the manufacturer's works will be rejected, and the manufacturer shall be notified.

17. Samples tested in accordance with Section 5, which represent rejected splice bars, shall be preserved for two weeks from the date of the test report. In case of dissatisfaction with the results of the tests, the manufacturer may make claim for a rehearing within that time.

HIGH CARBON STEEL SPLICE BARS.

I. *Manufacture.*

1. The steel shall be made by the open-hearth process.

2. The splice bars shall be punched, slotted and, in the case of special designs, shaped at a temperature not less than 750 deg. C.

II. *Chemical Properties and Tests.*

3. The steel shall conform to the following requirements as to chemical composition:

Carbon	not under 0.45 per cent.
Phosphorus	not over 0.04 per cent.

4. An analysis to determine the percentages of carbon, manganese, phosphorus and sulphur shall be made by the manufacturer from a test ingot taken during the pouring of each melt, a copy of which shall be given to the purchaser or his representative. This analysis shall conform to the requirements specified in Section 3. Drillings for analysis shall be taken not less than ⅛ in. beneath the surface of the test ingot.

5. Analyses may be made by the purchaser from finished splice bars representing each melt, in which case an excess of 25 per cent. above the requirement as to phosphorus specified in Section 3 shall be allowed.

III. *Physical Properties and Tests.*

6. The splice bars shall conform to the following minimum requirements as to tensile properties:

Tensile strength, lbs. per sq. in.	85,000
Elongation in 2 in., per cent.	14

7. The bend test specimen specified in Section 8 shall bend cold through 90 deg. around a pin the diameter of which is equal to three times the thickness of the specimen, without cracking on the outside of the bent portion.

8. Tension and bend test specimens shall be taken from the finished bars. Tension test specimens shall be of the form and dimensions shown in Fig. 1. Bend test specimens may be ½ in. square in section, or rectangular in section with two parallel faces as rolled.

9. If preferred by the manufacturer and approved by the purchaser, the following bend test may be substituted for that described in Section 7: A piece of the finished bar shall bend cold through 45 deg. around a pin the diameter of which is equal to three times the greatest thickness of the section, without cracking on the outside of the bent portion.

10. (*a*) One tension and one bend test shall be made from each melt.

(*b*) If any test specimen shows defective machining or develops flaws, or if a tension test specimen breaks outside the gage length, it may be discarded and another specimen substituted.

IV. *Workmanship and Finish.*

Same as for medium-carbon steel splice bars.

V. *Marking.*

Same as for medium-carbon steel splice bars.

VI. *Inspection and Rejection.*

Same as for medium-carbon steel splice bars.

EXTRA-HIGH-CARBON STEEL SPLICE BARS.

I. *Manufacture.*

1. The steel shall be made by the open-hearth process.

2. The splice bars shall be punched, slotted, sheared and, in the case of special designs, shaped at a temperature not less than 750 deg. C.; except that bars may be cold-sawed.

II. *Chemical Properties and Tests.*

3. The steel shall conform to the following requirements as to chemical composition.

Phosphorus	not over 0.04 per cent.

4. An analysis to determine the percentage of carbon manganese, phosphorus and sulphur shall be made by the manufacturer from a test ingot taken during the pouring of each melt, a copy of which shall be given to the purchaser or his representative. This analysis shall conform to the requirement specified in Section 3. Drillings for analysis shall be taken not less than ⅛ in. beneath the surface of the test ingot.

5. Analyses may be made by the purchaser from finished splice bars representing each melt, in which case an excess of 25 per cent. above the requirement specified in Section 3 shall be allowed.

III. *Physical Properties and Tests.*

6. The splice bars shall conform to the following minimum requirements as to tensile properties:

Tensile strength, lbs. per sq. in.	100,000
Elongation in 2 in., per cent	10

7. The bend test specimen specified in Section 8 shall bend cold through 60 deg. around a pin the diameter of which is equal to three times the thickness of the specimen, without cracking on the outside of the bent portion.

8. Tension and bend test specimens shall be taken from the finished bars. Tension test specimens shall be of the form and dimensions shown in Fig. 1. Bend test specimens may be ½ in. square in section, or rectangular in section with two parallel faces as rolled.

9. If preferred by the manufacturer and approved by the purchaser, the following bend test may be substituted for that described in Section 7: A piece of the finished bar shall bend cold through 30 deg. around a pin the diameter of which is equal to three times the greatest thickness of the section, without cracking on the outside of the bent portion.

10. (*a*) One tension and one bend test shall be made from each melt.

(*b*) If any test specimen shows defective machining or develops flaws, or if a tension test specimen breaks outside the gage length, it may be discarded and another specimen substituted.

IV. *Workmanship and Finish.*

Same as for medium-carbon steel splice bars.

V. *Marking.*

Same as for medium-carbon steel splice bars.

VI. *Inspection and Rejection.*

Same as for medium-carbon steel splice bars.

RAIL-STEEL REINFORCING BARS.

Prof. W. K. Hatt presented a paper giving a description of the method used for rerolling old steel rails into reinforcing bars for concrete work. In a general way the first thing done is to reheat the rails in short lengths and send them through a splitting machine that severs the web from the head and flange, thus dividing it into three sections. These three sections are then rerolled into reinforcing bars of different weights. A table of tests that was presented shows that bars made from the web were the strongest of the three, that this was followed by the bars from the head, while those from the flange were the weakest. This does not mean that any of them were of a low grade as the lowest tensile strength recorded of bars rolled from old rails was 90,000 lbs. per square inch ultimate strength. Of the various types of bars rolled it was found that the twisted bars were weaker than the square and regular forms and that, in addition to this, they did not bend as easily.

It was stated in the discussion that about 100,000 tons of old rails are now rerolled annually into reinforcing bars.

Protection Against Strikes in India.—The Madras chamber of commerce forwarded to the committee of the Bengal chamber a copy of a representation they had addressed to the government of India on the subject of the strike recently threatened on the Madras & Southern Mahratta Railway. The Madras chamber suggested that the government should consider the desirability of taking such legislative and other measures as might be thought necessary to deal with strikes on Indian railways. The object of these measures would be to safeguard commercial interests, and the convenience of the travelling public, and to ensure that strikes are not initiated without the concurrence of a majority of the railway employees concerned, or without reasonable notice. The Bengal committee agreed to this recommendation, and decided to extend their support to it. It was, they thought, advisable that the question should receive the attention of the government, and that the feasibility of such measures as the Madras chamber had proposed should be considered. They accordingly addressed the government of India in this sense.

THE RAILROAD VALUATION COMMITTEE.

The railroads' committee on valuation of property, appointed to conduct the necessary conferences with the Interstate Commerce Commission, and which was noticed in the *Railway Age Gazette* of May 2 and May 23, met in New York City on Monday of this week and discussed ways and means of assisting the Interstate Commerce Commission in the valuation work which is to be done under the law recently passed. The discussion covered the question of preparation of inventories of the physical property, the extent to which existing records of the railroad companies can be helpful to the government and economical methods of furnishing the same to the commission.

The committee consists of the following eighteen railway officers, all of whom have the title of president except Mr. Trumbull (chairman); Mr. Kruttschnitt (chairman of executive committee); Mr. Winchell (receiver); and Messrs. Storey and Holden (vice-president): Samuel Rea, Pennsylvania; W. C. Brown, New York Central; L. F. Loree, Delaware & Hudson; Frank Trumbull, Chesapeake & Ohio and Missouri, Kansas & Texas; F. D. Underwood, Erie; Julius Kruttschnitt, Southern Pacific; George F. Baer, Central of New Jersey; Daniel Willard, Baltimore & Ohio; B. L. Winchell, St. Louis & San Francisco; W. A. Gardner, Chicago & North Western; B. F. Bush, Missouri Pacific; H. U. Mudge, Chicago, Rock Island & Pacific; W. W. Finley, Southern; T. M. Emerson, Atlantic Coast Line; W. J. Harahan, Seaboard Air Line; L. E. Johnson, Norfolk & Western; W. B. Storey, Jr., Atchison, Topeka & Santa Fe; Hale Holden, Chicago, Burlington & Quincy. The general chairman of the committee is Mr. Rea; Mr. Loree is chairman of the eastern group; Mr. Finley of the southern, and Mr. Holden of the western.

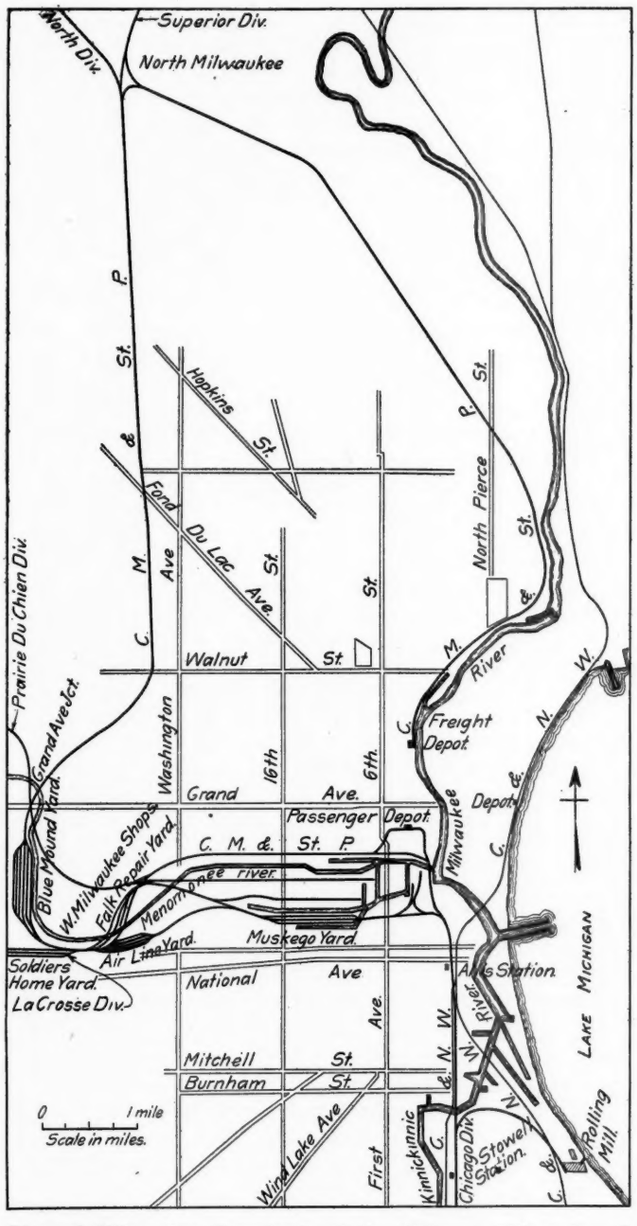
The committee of presidents has added to its number fifteen engineers to deal with details of physical valuation. These engineers will confer with the engineers of the government at Washington, next week, Tuesday. They are Thomas W. Hulme (Penn.), general secretary of the presidents' committee and ex-officio member of the engineers' committee. Four, representing the eastern roads, as follows: Geo. W. Kittredge, New York Central; Charles Hansel, recently valuation engineer for the state of New Jersey; M. L. Beyers, Delaware & Hudson; J. B. McCubbin, Jr., real estate agent, Baltimore & Ohio. Four for the southern district as follows: D. W. Lum, special engineer, Southern Railway; C. S. Churchill, chief engineer, Norfolk & Western; W. L. Seddon, assistant to president, Seaboard Air Line; Robert Scott, superintendent insurance department, Atlantic Coast Line. Five for the western district as follows: E. Holbrook, valuation engineer, Southern Pacific and Union Pacific; H. C. Phillips, valuation engineer, Atchison, Topeka & Santa Fe; C. H. Smith, assistant engineer, Missouri Pacific; J. B. Berry, assistant to president and valuation engineer, Chicago, Rock Island & Pacific; Thomas Cooper, assistant to president and land commissioner, Northern Pacific.

Projected Subway for Genoa, Italy.—The Superior Council (Consiglio Superiore) of Public Works of Italy has approved the project for a 6⅓-mile subway for Genoa from Sampierdarena to Genoa, and thence to Quarto dei Mille along the coast. Estimates of cost of the work and materials have not been definitely adopted, but the original estimate contemplated expending at least $3,667,000, which will no doubt be increased. The subway would have 14 stations, four above and ten underground, three of these latter having two or three passenger elevators each. There would be almost 28,900 ft. of underground tunnel, mostly rounded inside, about 3,250 ft. elevated in the open, 1,214 ft. on ground level, and 270 ft. of bridge work. Continuous current, third rail electric traction would be used, the rails to be of the same kind as those on Italian State railways, weighing 93 lbs. per yard.

THE ST. PAUL IMPROVEMENTS AT MILWAUKEE.

The New Terminal and Hump Yard Which Has Cost $750,000 and Will Relieve the Congestion Which Had Begun to Be Serious.

The Chicago, Milwaukee & St. Paul has recently completed important terminal developments at Milwaukee, Wis., requiring the moving of nearly a million yards of earth and the expenditure of about $750,000. It is expected that these improvements will relieve a congestion which has been gradually increasing at this point for several years. In addition to heavy local business at Milwaukee there is a large interchange business with car ferries and boats operating on the lakes. This lake traffic com-



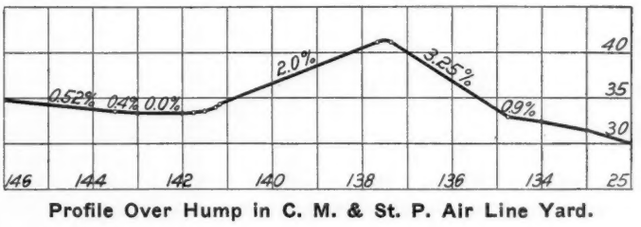
Plan of Milwaukee Terminals of the Chicago, Milwaukee & St. Paul.

plicates the terminal problem seriously because of the storage room required for holding cars several days at a time waiting for boats.

The terminal conditions existing at Milwaukee are best understood by outlining the early development of this road at this point. Entrance to the city is effected by five different divisions, four of which were built as separate lines. The first of these to enter the city was that now known as the Prairie du Chien division coming in directly from the west. A short time later the La Crosse division was built in from the northwest, crossing the Prairie du Chien division at Brookfield, 14 miles west of Milwaukee and entering the city a short distance south of the first line. A short time afterwards the line now known as the Northern division was built from Fond du Lac and Portage to a terminus on the west bank of the Milwaukee river near Chestnut street. Later the Superior division was built from Lake Superior south through Green Bay to a connection with the Northern division north of Milwaukee, using its Chestnut street terminal.

These four lines gradually came under the control of one management, which later built the extension south to Chicago. When the Northern and Superior divisions were taken over, a cut off was built from North Milwaukee to a connection with the Prairie du Chien division at Grand avenue. The trains from these lines were then brought into the terminal used by the La Crosse and Prairie du Chien divisions, the Chestnut street line being devoted to industrial purposes. Later the Prairie du Chien and La Crosse division tracks were operated as double track from Brookfield into the city. A few years ago the Prairie du Chien division was double tracked to Brookfield and all passenger trains and a large part of the freight traffic for both divisions now use this line in both directions.

At the time of their consolidation, each of the four divisions had small yards on their respective lines, but these were gradually abandoned and a general yard for classification purposes



Profile Over Hump in C. M. & St. P. Air Line Yard.

was gradually built south of the Menomonee river and a short distance west of the present passenger station. This yard has been outgrown for some time and expansion on the present site was limited by the Menomonee river on the north and a line of bluffs on the south. Also, its location was such that the handling of traffic between this yard and the various industries was very expensive. Because of the very high property values, the Chestnut street branch has never been extended south to a connection with the other lines near the present station, although only about five blocks intervene. A large amount of freight is destined to and originates on this branch. All this traffic has to be taken from the classification yard west and north through Grand Avenue Junction and North Milwaukee, making a haul of about 15 miles. Much of this traffic comes from the northern and western divisions and passes Grand Avenue Junction and North Milwaukee on the way into the city, so that a considerable back haul results. Likewise, a large amount of business destined to the rolling mills about five miles south of the yard came from Chicago, frequently in trainload lots and a similar back haul resulted here. Such was the condition when the present systematic development of the terminal facilities was authorized.

BLUE MOUND RECEIVING YARD.

The first step taken was the building of a new eastbound receiving yard near Grand Avenue Junction in order to eliminate the back haul on the freight destined for the north and west sides of the city. Property was secured along the west bank

of the Menomonee river from Grand avenue south to the old La Crosse division on which this yard is being built. The river was moved eastward for about 2,000 ft. and straightened to provide room for the tracks. With the exception of a small hill at the south end of the yard, which was cut down and the material placed in the embankment, the entire yard is built on a fill averaging 20 ft. in height and requiring about 550,000 yards of earthwork. This material was loaded by steam shovels in gravel pits about 20 miles west of the city and brought in by trains. From Grand Avenue Junction four main tracks, two each for freight and passengers, extend south about 1,000 ft. to the north end of the new yard. The passenger tracks turn east at this point, while the yard continues south almost to the old La Crosse division tracks, where it turns through an angle of approximately 90 deg. and terminates in a lead to the hump yard a short distance east. Six 80 car tracks extend the entire length of the yard. Eleven other tracks with a capacity of 50 cars each are provided, while four short tracks are built south of the main yards, where way freights can be handled without delay or interference to other traffic.

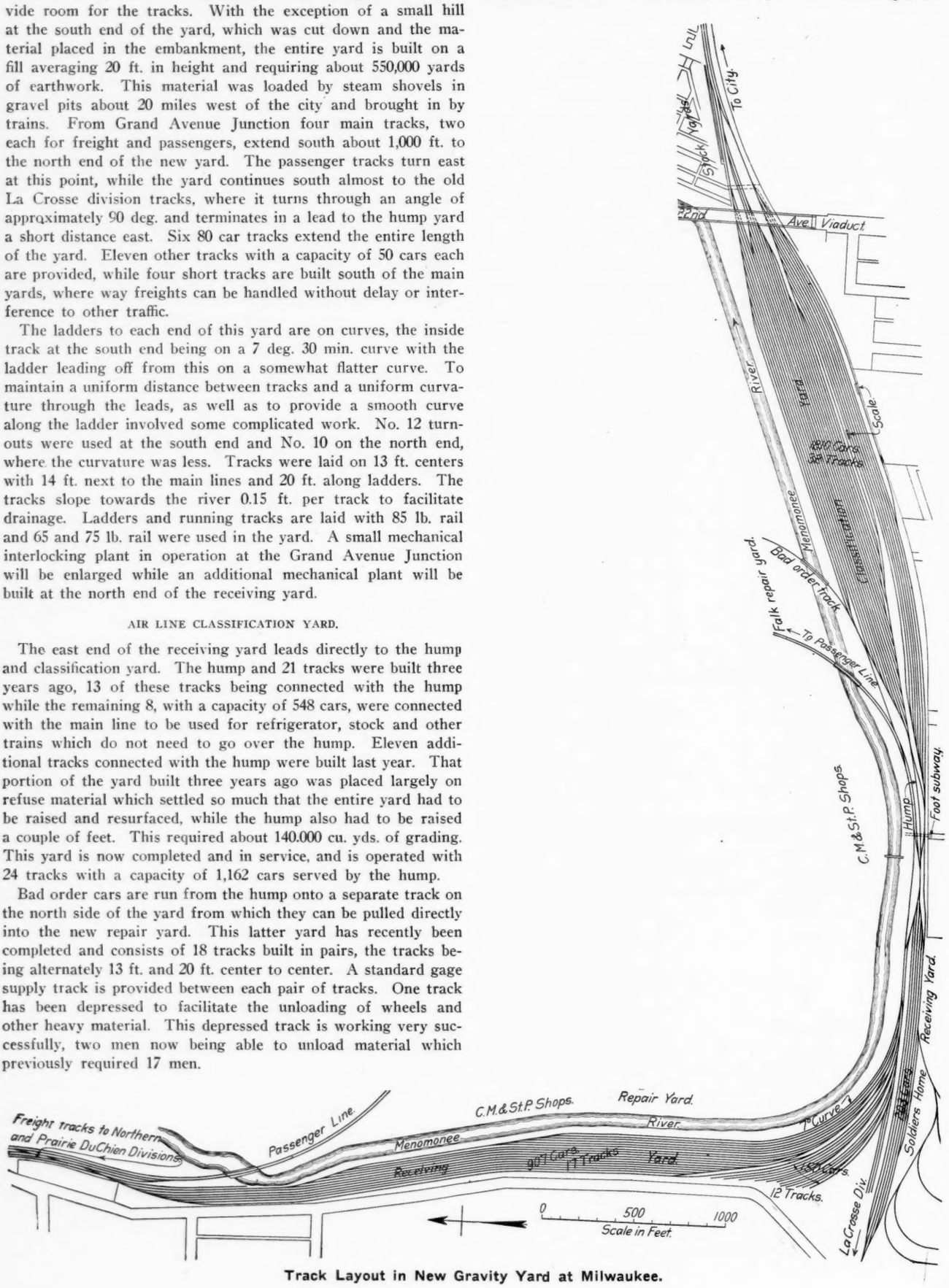
The ladders to each end of this yard are on curves, the inside track at the south end being on a 7 deg. 30 min. curve with the ladder leading off from this on a somewhat flatter curve. To maintain a uniform distance between tracks and a uniform curvature through the leads, as well as to provide a smooth curve along the ladder involved some complicated work. No. 12 turnouts were used at the south end and No. 10 on the north end, where the curvature was less. Tracks were laid on 13 ft. centers with 14 ft. next to the main lines and 20 ft. along ladders. The tracks slope towards the river 0.15 ft. per track to facilitate drainage. Ladders and running tracks are laid with 85 lb. rail and 65 and 75 lb. rail were used in the yard. A small mechanical interlocking plant in operation at the Grand Avenue Junction will be enlarged while an additional mechanical plant will be built at the north end of the receiving yard.

AIR LINE CLASSIFICATION YARD.

The east end of the receiving yard leads directly to the hump and classification yard. The hump and 21 tracks were built three years ago, 13 of these tracks being connected with the hump while the remaining 8, with a capacity of 548 cars, were connected with the main line to be used for refrigerator, stock and other trains which do not need to go over the hump. Eleven additional tracks connected with the hump were built last year. That portion of the yard built three years ago was placed largely on refuse material which settled so much that the entire yard had to be raised and resurfaced, while the hump also had to be raised a couple of feet. This required about 140.000 cu. yds. of grading. This yard is now completed and in service, and is operated with 24 tracks with a capacity of 1,162 cars served by the hump.

Bad order cars are run from the hump onto a separate track on the north side of the yard from which they can be pulled directly into the new repair yard. This latter yard has recently been completed and consists of 18 tracks built in pairs, the tracks being alternately 13 ft. and 20 ft. center to center. A standard gage supply track is provided between each pair of tracks. One track has been depressed to facilitate the unloading of wheels and other heavy material. This depressed track is working very successfully, two men now being able to unload material which previously required 17 men.

The Blue Mound receiving yard connects through the south ladder to the hump in the Air Line yard on a level grade which changes at the foot of the hump to a 2 per cent. ascending grade



Track Layout in New Gravity Yard at Milwaukee.

for 375 ft. Passing over the summit on a short vertical curve 40 ft. in length, there is then 300 ft. of 3.25 per cent. grade descending onto the ladders. From this point the southerly track off the hump continues for 1,800 ft. on a .3 per cent. descending grade, where it changes into a .09 per cent. grade to the end of the yard. To provide for transverse drainage towards the river on the north, the grade from the foot of the hump is continued through the ladder onto the north track at 1.10 per cent. for 800 ft. after which it is reduced to 0.1 per cent. for the balance of the distance through the yard. The grades of the intervening tracks are adjusted between these two limits to provide for uniform transverse slopes.

SMALL STORAGE YARDS.

One interesting feature connected with this development is the construction of small storage yards on each of the lines entering the city, outside of the present yards but within the switching limits. In this way, should the receiving yard be blocked it will not be necessary to hold a train out on the line or to block a passing track, but the train will be left in this yard only a few miles out and the engine and crews released. The train can then be brought into the receiving yard by a switching engine whenever there is room for it. Two such yards of two 72 car tracks each are located on the Superior and Northern divisions a short distance north of North Milwaukee. A third yard of four 80 car tracks for the two western divisions is built at Elm Grove, nine miles from the city, while a fourth yard with five 40 car tracks is located on the old La Crosse division adjacent to the south end of the receiving yard. This yard will be used for the collection of traffic from various industries along this line and also for trains from the two western divisions, which can be diverted over the old La Crosse division from Brookfield.

At Lake, seven miles south on the Chicago division, two yards of six 75 car tracks each are being built. A third track is also being built from the city to this yard, the combined work requiring 115,000 yards of grading. This yard was located at this point because Lake lies at the summit of the ruling southbound grade between Milwaukee and Chicago, and in this way practically governs the spacing of the trains for the entire 80 miles. Tonnage freight trains now require help up to this point and at best move very slowly. The construction of the third track will not only provide for switching movements between this yard and the city, but will also assist in the movement of the slow freight trains. All traffic for the rolling mills and other industries on the south side of the city will be set out and picked up in this yard. In this way many trains can come over the ruling grade with reduced tonnage and fill out at this point, while the back haul on cars destined to the rolling mills and other industries will be eliminated.

This work was handled under the direction of C. F. Loweth, chief engineer; W. H. Penfield, formerly assistant chief engineer and now assistant to the vice-president, and Charles Lapham, district engineer with W. B. Swartwout, assistant engineer in charge of the construction.

OPENING OF MADAGASCAR RAILWAY.—Through service was inaugurated on March 9 over Madagascar's railroad between Tananarive, the capital, and Tamatave, the principal port. It is 229 miles long and cost $13,210,850. There is now a biweekly passenger and mail service of 15 hours and a through daily freight service of 36 hours, as well as a local freight service. The first-class passenger fare is 6.2 cents per mile; second-class, 3.1 cents; and third-class, 1.24 cents; with 25 per cent. reduction on 30-day round-trip tickets. Season tickets are also issued. Freight is classified into five categories, and pays going up country, toward Tananarive, 1.5 to 18 cents per ton per mile for the first 150 kilometers (93.21 miles); 1.5 to 15.5 cents, from 150 to 200 kilometers (93.21 miles to 125 miles); and 1.5 to 11 cents beyond 200 kilometers. Coming down from Tananarive the rates on freight are 1.5 to 14 cents per ton per mile for all distances.

ASSIGNMENT OF EQUIPMENT VALUATION BY STATES.*

BY A. I. THOMPSON,
Engineer, Corporation Commission of Oklahoma.

In the apportionment of the cost of steam railroads, one of the most important items is the equipment assignment to the several states. Actual railroad practice shows that some equipment is permanently assigned for a fiscal period, while other equipment is used promiscuously over the system and where traffic demands its use.

In order to arrive at a reasonable assignment of the cost of rolling stock, it is, therefore, necessary to adopt some plan by which each state will be charged with the cost of equipment which is actually used therein. There are several theories, but only one correct method.

The assignment of cost of equipment to the several states on the "road mile" theory contemplates that that portion of the total cost of all equipment be assigned to the states which is represented by the fraction of the "road mileage" within the given state over the total "road mileage" of the company. For example, if the road mileage of a carrier in a given state was 100 and the total road mileage of a system 1,000, then one-tenth of the total cost of equipment, regardless of kind, class, type, cost or where operated, would be assigned to that state, as illustrated by the following table:

M. K. & T. RY. ASSIGNMENT OF EQUIPMENT, IN SERVICE, TO OKLAHOMA ON THE "ROAD MILEAGE" THEORY, AS OF JULY 1, 1912.

Main track mileage of system	1,744.44
Main track mileage in Oklahoma	729.52
Steam locomotives, average cost per mile	$4,417.69
Passenger train cars, average cost per mile	1,886.00
Freight train cars, average cost per mile	10,204.22
Work equipment, average cost per mile	706.00
Average cost per mile, all classes	$17,213.91
Average cost per mile, all classes, less depreciation	$12,450.29

The fallacies of this theory are that the cost of equipment is not assigned in accordance with the traffic demands or "use" of such equipment, and a state with a greater proportion of branch line mileage would be charged with cost of equipment which had never been used in that state.

Apply this theory, in assigning the cost of the Atchison, Topeka & Santa Fe equipment, to Oklahoma, with 843 miles of operated road, and Illinois, with 290 miles of operated road, practically all main lines. In Illinois trains are operated as frequently as time permits, and with higher and more expensive equipment than in Oklahoma, and one can readily see that this theory of assigning equipment would not be equitable and, therefore, would be radically wrong. In rate litigations the carrier would have cost of equipment assigned and included in a given state which had never been operated in that state.

At a recent conference in our state, the committee for the carriers brought forth a theory of assigning equipment which may be defined as the "total car and locomotive mile" theory, which contemplates that such portion of the total cost of all equipment be assigned to a given state as is represented by the

Equipment, in service, assigned to Oklahoma on a mileage basis in the proportion as the miles made on each class of equipment in the State bears to the miles made on the entire system by the same class of equipment, except work equipment, which is in the proportion of the total miles made on the entire system:

M. K. & T. RY. CO.

Classes.	Mileage made on system.	Mileage made in Oklahoma.	Av. cost per mile assigned to Oklahoma.
Steam locomotives	9,740,669	3,877,203	$4,194.69
Passenger train cars	15,334,810	6,875,966	2,017.12
Freight train cars	110,037,327	43,843,678	9,698.87
Work equipment	222,722,806	54,596,847	412.83
Average cost per mile, all classes			$16,323.51
Average cost per mile, all classes, less depreciation			$11,838.27

*Abstract of a paper presented at a conference of Railroad Commissions of Mississippi Valley States, Des Moines, Iowa, on June 6, 1913.

fraction of the total passenger, freight, work or locomotive miles made in a state over the same factors for the system. Thus if the total locomotive miles in the state were 100 and on the system 1,000, then one-tenth of the locomotive cost of the respondent would be assigned to such state, as illustrated by the accompanying table.

The mistake is automatically made where this theory is used, that differences in traffic conditions which require either heavy or light locomotives, old or new passenger cars, are not accurately reflected. We do not believe the assignment of cost of expensive locomotives or passenger equipment to the state where such locomotives or passenger cars were never operated would be fair or just. For instance, the state of South Dakota, in which we understand there is not an expensive locomotive on the Chicago & North Western, or an electric lighted or steam heated passenger car, should not be charged with the cost of such equipment.

If the plan of assigning equipment cost is unfair or unjust to one state, then the assignment of costs to all states on that system is relatively unfair. If the state of South Dakota or Oklahoma, or any other state, is charged with any other than the cost of the actual equipment used in that state, then the value of the assignment to all other states is also in error. So, if, by use of the foregoing theories, a state is charged with more than its pro rata of the cost, then, to be fair, we must produce a formula which will permit of the assignment to all states of such equipment as is actually used therein.

With the individual assignment of equipment on the "use" basis, the writer believes that the carriers should receive the benefits of the actual cost of equipment actually used for public service. If given states are benefited by the operation of heavy power, or new, expensive and luxurious equipment, then the traffic of such given states should bear the burden. The writer further contends that heavy, new or expensive equipment will not be installed by the carriers, except where the traffic demands it, and that the unit cost will not, in his opinion, be greater than where the traffic and equipment are lighter.

Rates in the state of South Dakota, or any other state, should be based in part upon the cost of equipment actually operated there. If traffic in a state does not receive the benefit of electric lighted and steam heated cars, and up-to-date motive power, it would be manifestly unfair to charge such traffic with the cost of such equipment. If the total freight car valuation should be assigned upon a total mileage basis, i. e., according to the relation of the freight car miles in the state to the total freight car mileage of the system, then I would approve of the charging of increased cost of equipment to a state or division, when actually only a part, and in some instances not any of a particular kind or class of equipment had been used.

In order, therefore, to secure an impartial cost it is necessary to assign equipment upon an actual "use" basis. We will discuss each phase separately.

LOCOMOTIVES.

The cost of locomotive equipment should be assigned to a given state, and division, in the ratio that the miles made by that individual locomotive in that state or on that division, bears to the total mileage of that locomotive as made during the fiscal year for which the report is rendered.

The statement has heretofore been made that heavier and more expensive equipment is used in Illinois than is used in Oklahoma. During the fiscal year ended June 30, 1911, the average number of tons of freight per train mile in Illinois on the Santa Fe was 357.99, and in Oklahoma, 280.32; the average number of cars per freight train mile in Illinois was 33.78, as compared with 26.80 in Oklahoma. On the Rock Island the average number of tons of freight per train mile in Illinois was 437.62 compared with 246.18 in Oklahoma; and, the number of freight cars per train mile in Illinois was 34.39 compared with 26.30 in Oklahoma.

In view of these facts, it is reasonable to assume that in states like Illinois, where traffic is heavy and equipment used is more luxurious and expensive than in South Dakota, locomotives are larger and more expensive. If this fact is ignored, the public through the regulating commissions, would certainly have reason to object, and the right to exercise control over supervision would become more essential. If the carriers, in states where traffic is light, should persist in operating power too expensive and heavy for traffic, the public through the regulating commissions would certainly have reason to object, and the right to exercise supervision over such carriers would become more essential. On the other hand, if traffic is heavy and carriers persist in attempting to operate with light power, the necessity for public regulation is again emphasized.

I have the greatest consideration for the ability of the operating official, who, knowing that the traffic demands light or heavy power, can use locomotives adequate for the service without detriment to it, and the assignment of the cost of equipment should reflect the true cost. I believe those conversant with railroad practice will agree that the large locomotives are located where there are excessive grades or where heavier trains are handled. There is no consistency in charging to South Dakota, for example, a part of the cost of the expensive locomotives used in pulling the immense trains between Chicago and Cedar Rapids, while the locomotives actually used in South Dakota (perhaps adequate for the service demanded of them) are in such a condition that, from a tonnage standpoint, their operation on the main line would increase operating expenses. It must be admitted, of course, that the heavy through passenger trains, such as the "Pioneer Limited" and the Santa Fe "De Luxe," consisting of heavy Pullman cars, require a heavier class of power than trains in South Dakota, with only a few coaches. Superheater compound locomotives cost more than simple engines, and if any other than an assignment on the "individual locomotive" basis is used, cost will be assigned which has no connection with the actual "use" or operation. With but little additional expense records of the operation of these locomotives can be kept. A great many carriers keep records of the performance of individual locomotives at this time.

PASSENGER CAR EQUIPMENT.

Passenger train equipment generally is permanently located for each fiscal year, and thus we find that on many lines the same cars are used from year to year. The cost of passenger car equipment should be assigned to the several states in the proportion that the individual car mileage in a given state bears to the total mileage of the individual car during the year. Citing again the example of the South Dakota car, the writer feels certain that that state should not bear the cost of expensive steel equipment, cafe and dining cars and the like, when it is shown that such equipment is not operated in that state. The passenger traffic in South Dakota should not be charged with the cost of reclining chair cars unless traffic receives the benefits of chair car operation.

FREIGHT CAR EQUIPMENT.

Although at this time it may be impracticable, the proper method of charging the cost of freight car equipment would be assignment to the states on the individual car mileage basis. A method which is more practical and one which should be used, is to assign to each state, and division, that portion of the cost of box car equipment that is represented by the fraction of the "box car mileage" made in the state or division during the period for which the report is made and the total box car mileage on the system. The use of the foreign car miles for the assignment of equipment is on account of the operating practice of using, without discrimination, foreign cars in lieu of system owned cars. Thus, if the foreign and system box car miles in a given state were 100 and the total foreign and system box car miles on the railroad's line during the fiscal year were 1,000, then one-tenth of the total box car cost should be assigned to the given state. If the same method is applied to cabooses, refrigerator, coal and stock cars, etc., individually, it will permit of an assignment of classes of equipment to the territory where

those particular classes of equipment predominate. On a division or in a state where coal traffic predominates, more coal car equipment should be assigned than in a state or on a division where the traffic demands furniture cars. By assigning freight car equipment cost by individual classes, a very accurate assignment can be made, and traffic involving the use of any particular class of cars will have to bear its proportion of the cost.

When units of equipment are not in service during a fiscal year, the cost thereof should be apportioned to the several states in proportion to the respective states' car or locomotive mileage.

WORK EQUIPMENT.

Work equipment cost should be assigned to the several states on the "use" basis—i. e., the cost of each unit should be assigned to a given state in the proportion that the time it has been in service in that state bears to the total time it was in service during the period for which the report is rendered. It is understood that the dead time of each unit shall be apportioned on the basis of the car and locomotive mileage of those states only which would be benefited by it if in use. For example, if a railway owned a steam shovel that cost $2,000, and for the year in question it was in service six months in Oklahoma and six months in Kansas, then the cost should be apportioned equally to each state.

When units of work equipment are not in service, their cost should be apportioned on the basis of the respective states' car and locomotive mileage during the year for which the report is rendered, but again such apportionment should be made only to those states which would, in ordinary practice, receive the benefit of them. This would prevent the assignment of the cost of rotary and other snow plows to southern states, and other apparent inconsistencies.

In conclusion, in my opinion, unless the assignment is made on the "unit basis" the efficiency of the various commissions' studies of the operation and depreciation of car and locomotive equipment will be destroyed, and the value of the compiling of statistics will be greatly impaired.

NEED OF BETTER BOXES FOR FREIGHT.*

From statistical reports of the Interstate Commerce Commission it is estimated that an annual loss to our national resources of not less than thirty millions of dollars is sustained through damage to railway freight. The magnitude of this loss and the fact that millions of our fellow citizens are vitally interested in minimizing it, insures the attention of this Society for any reasonable comment. Among the prominent causes we recognize theft, insecure packing, illegible and incorrect marking, rough handling of packages in cars and improper loading of freight into cars. We are to give special attention to the advisability of standardizing specifications for shipping containers with a view to minimizing the losses that are due to insecure packing. .

During the rush period in the late afternoon receiving clerks are barely able to verify the shipper's list of packages and no time is available for a critical examination of these packages to discover defective containers. Add to this the natural contention of railway traffic officers that revenue-bearing freight should not be refused under any circumstances, and it is plain that the carrier is not well protected against the shipper who is willing to reduce the cost of his shipping container at the expense of its efficiency. The carrier's struggles against freight congestion have developed the automatic coupler, the gravity track or "hump" and the steel-underframe freight car. The effect is to reduce from minutes to seconds the time required to move and group these cars on specified tracks and to increase correspondingly the severity of the shocks incident to this rapid disposition. The steel-underframes will stand the shocks and the trainmen do not see, as a rule, the effect on the packages in the car. It is useless to suggest as a remedy that we avoid all shocks to cars. Some increase in the roughness of handling cars is a natural development in the struggle against congestion of freight.

What is a reasonable limit to the speed in miles per hour at which a freight car should be permitted to collide with other cars in switching movements? The answer must recognize the conditions that require the classification of a large number of cars in a limited time. To couple cars carefully, the speed should not exceed two miles per hour at the instant of collision. This limit was not observed with any degree of uniformity even when hand-operated couplers were in use. Friction draft gears, now used almost to the exclusion of the old spring buffers, are constructed to absorb about 18,000 ft. lb. of energy each, or 36,000 ft. lb. for the two gears involved in any impact. This energy is furnished by a loaded freight car weighing 150,000 lbs. and moving at a speed of 2.68 miles per hour. For any speed in excess of this the additional energy must be absorbed by the elastic, or permanent, deformation of the car frame. The draft-gear energy limit of 36,000 ft. lb. restricts the coupling speed for an empty freight car of average weight to about five miles per hour. When a column of packages occupies the entire length of a car the pressure on the end package for a coupling speed of five miles per hour may exceed five times the total weight of the column of packages. When these packages are free to slide along the car floor the coefficient of friction will be high and a path of from two to three feet may suffice; but this frictional resistance is not a practical remedy.

Some of the men employed by the railways to handle freight cars are criminally careless and indifferent. They work frequently at night and at isolated points where direct and constant supervision of them is practically impossible; and they belong to labor unions that are credited with resisting unreasonably, but successfully, the disciplining of their members. The development and use of a reliable and efficient time and shock-recording instrument would help to prove their delinquencies in handling cars roughly. An extended educational campaign, persistently followed, should secure the cooperation of the better and more numerous class of trainmen and the exercise of their influence over their careless and indifferent members.

It is not wise to strain any material beyond its elastic limit, and the path required to absorb the energy of a colliding freight car ought not to exceed that afforded by the friction draft gear. There is a distinct advantage in permitting the coupling speed for the average car to be as high as the draft gear will permit, as this will facilitate prompt movement of cars and delivery of freight. Let us assume by way of illustration that the maximum limit for this speed is placed at four miles per hour and that the maximum pressure on a package of freight in the end of the car due to this shock is four times the total weight of the column of packages in the length of the car; then the shipper should furnish a package capable of standing this pressure with a reasonable factor of safety.

For goods requiring protection, shipping containers made under standard specifications should be used. Instead of standard specifications we now have unlimited competition in the reduction of cost. The average box maker knows approximately the thickness of lumber that he should use in a given box, but he will cease to be an average manufacturer if he refuses to reduce this thickness to any degree necessary to secure or keep a customer. The average shipper may know that a fiberboard box does not possess the required strength to protect his material against pressure, but he is liable to take the chance as long as he can collect his freight claims. The shipper who realizes and meets his obligation to use efficient containers feels constrained to follow the example of a less scrupulous rival in reducing the cost of his shipping department.

When the fiberboard box was introduced some years ago as a proposed substitute for the wooden box as a shipping container, the railroads noted its failure in many cases to protect its contents and additional freight charges were assessed as "penalties" against the substitute package. . . . The wooden-box mak-

*Extracts from a paper on Conservation and Shipping Containers, by Col. B. W. Dunn, Chief Inspector of the Bureau of Explosives, read before the American Society for Testing Materials, at Atlantic City, June 24.

ers did not appreciate the importance of their new competitor and really encouraged its growth by their failure to follow its standardizing example. Many of them fear at the present time that a standard for wooden boxes would, by increasing the average cost, give an increased leverage to the promoters of the substitute package. This fear is not well founded. If a standard for a stronger package is established it will be used to keep the weaker one from adoption for the shipment of freight that needs protection against pressure.

Even if we could overcome all other impediments to the preparation of standard specifications for all kinds of containers, boxes, barrels, etc., there would still remain the pronounced difficulty of doing so. The thickness of lumber in a box, for example, would have to depend on the kind of lumber, the size of the box, and the weight of the contents. A standard only approximately correct would be better, however, than none; and a serious attempt by one or more experts in each package-manufacturing industry would soon furnish at least an approximately correct standard for the product of that industry. . . .

The Bureau of Explosives has prepared specifications for metal and wooden packages for explosives and other dangerous articles (samples of which were presented by Colonel Dunn) and the Interstate Commission has approved them. The Commission might well exercise the same authority over shipping containers for all kinds of freight. . . .

NEWARK BAY TRESTLES REBUILT IN TWELVE DAYS.

The destruction by fire of about two-thirds of a mile of the trestle bridges crossing Newark Bay at Oak Island, N. J., was noted in the *Railway Age Gazette,* June 20, page 1580. The two companies interested, the Pennsylvania and the Lehigh Valley, got men and materials on the ground within a few hours after the fire was put out, and at noon, June 27, traffic was resumed over the bridge, two tracks having been completed in 12 days. The amount of lumber used was 2,857,059 ft., and about 1,500 men were constantly employed, an average of 1,000 men in the day time and 500 at night.

The Pennsylvania bridge, double track, was south of that of the Lehigh Valley, which also was double track. To restore communication as quickly as possible the Pennsylvania rebuilt its north track and the Lehigh Valley its south track; and they now have one double track railroad over the section that was burnt, which they use jointly. Nine contracting firms, engaged immediately after the fire, took part in rebuilding the bridges. Those engaged by the Pennsylvania worked from the east end and those engaged by the Lehigh Valley worked from the west end, finishing both tracks as they proceeded. The superintendent of the Pennsylvania was on the ground night and day, together with the principal assistant engineer, two division engineers, two supervisors, one assistant supervisor and three corps of engineers. On the part of the Lehigh Valley there was the superintendent and a somewhat smaller staff of officers. The underframes of many of the freight cars which were burnt having been of steel and very difficult to handle.

The tracks on these bridges are about 26 ft. above high water. The fire destroyed the superstructure and the piles down to the water's edge. The work of reconstruction began with sawing off the piles at the water level. On these were laid transverse sills, 12 in. x 14 in., and on these a new trestle was built, the legs being of 12 in. x 12 in. timbers. The batter posts are about 20 ft. long.

The disposition of the heavy traffic over these bridges during the 12 days that they were impassable was a problem of magnitude. The average daily traffic over the Lehigh Valley is about 40 trains each way and that over the Pennsylvania (to the Greenville freight terminus) about 35 trains (800 cars a day each way). Freight from western points on the Pennsylvania was sent north from Trenton, N. J., over the Belvidere Delaware division and the Lehigh & Hudson River to the Poughkeepsie bridge. About 5,000 cars, eastward and westward, were moved over this route. Considerable freight was moved to and through New York City by taking it over the Pennsylvania passenger line to the junction with the Delaware, Lackawanna & Western, east of Newark, whence it found an easy route to the facilities of the Lackawanna tidewater terminals. Other freight, in large volume, was taken to Waldo avenue, Jersey City, and thence southward over the tracks of the National Docks Railway, and, by means of a short connection which was built, to the tracks of the Lehigh Valley, and thence to the Greenville yards. The Hudson River docks of the Erie were also availed of to deliver cars to floats for transfer to Long Island City and other points in the harbor.

The Lehigh Valley suffered less inconvenience than the Pennsylvania, a connection with the Central of New Jersey, west of Newark Bay, having afforded convenient access to the main line of the Central, and thence to the Communipaw terminal of the Lehigh Valley, which is adjacent to the Central of New Jersey yards.

The following gives some of the interesting details of the work:

About 70 men were fed at the camp, including engineers, clerks, linemen, etc., the other men providing their own meals. Supervising force of engineers, etc., slept at the camp. There were two shifts of workmen, one day and one night, each working 12 to 16 hours. Floating derricks were employed to remove the wrecks of steel cars, etc.

In cutting the steel rail in order that it might be removed, from 100 to 120 men were employed, together with several oxy-acetylene cutting tools.

The following contractors were employed during the reconstruction: Stillman-Delehanty-Ferris Company, R. P & J. H. Statts, Henry Steers, Stern Construction Company, General Engineering & Construction Company, Rodgers Construction Company, P. Sanford Ross, Interstate L. & T. Company.

There was a physician on duty constantly during the progress of the work. For the supervising force there was provided an office car (coach) dining car, Pullman car and coach, with seats taken out and fitted with cots, the latter for the kitchen help. All these cars were completely screened and the dining car and sleeping car sewered and drained into a cesspool. Fortunately there was but little need for the services of the physician, a few men meeting with minor injuries and one man having his arm broken.

A complete electric light plant was established at the western end of the burned structure and wires carried out over the burned portion. On the eastern end, connection was made with the railroad company's electric light plant at Greenville yard and with the Public Service company's lines, and both arc and incandescent lamps carried out from the eastern end so that the whole of the burned portion of the bridge was provided with electric lights for night work.

Telephone lines were run out to about the middle of the burned portion, placing telephones to facilitate communication between the various parts of the work.

HARBOR AND RAILWAY IMPROVEMENTS AT FUSAN, KOREA.—The new railway pier at Fusan is one of the best works of its kind in the Far East. It is a little more than 906 ft. long and not quite 77 ft. wide, comprising nearly one and two-thirds acres. It is built mainly of steel and runs along an embankment reclaimed from the sea. The iron material used weighs 1,365 tons and was partly manufactured in Japan. The front of the pier was dredged to the depth of 24 ft. at low tide and two steamers of 3,000 tons each can be moored with ease at the same time. The embankment is about 420 yds. long and 38 yds. wide and is protected by a breakwater on the northern side. Rails connecting the pier with the Fusan station are laid.

SMOKE PREVENTION AND THE MECHANICAL STOKER.

D. F. Crawford, general superintendent of motive power of the Pennsylvania Lines West of Pittsburgh, spoke on "The Elimination of Smoke," before the New Century Club of Philadelphia, Pa., on May 15, 1913. He said in part:

"While it is true that locomotives produce a certain proportion of the smoke in localities where they are used, it is a fact that if all of the locomotives in use were to cease making smoke, but 20 to 40 per cent. of the smoke in cities such as Philadelphia, Chicago, Cleveland and Pittsburgh would be eliminated, leaving from 60 to 80 per cent. of the smoke now existing to trouble us. The railways of America produce transportation of passengers and freight at the lowest cost of any in the world, and to obtain this result large locomotives, and consequently large coal consumption, is necessary, and large coal consumption with comparatively small boilers means smoke. The dimensions of the locomotive boiler must be confined to the permissible limits of width and height clearance; its length made to conform to the limit of practicability, and for these reasons it is impossible to increase the capacity of the boiler; the further reason that the public demands rapid and luxurious transportation makes it impracticable to reduce the work required of each unit.

"The railways are most vitally interested in the elimination of smoke for economic reasons, namely, while smokeless combustion does not always mean economy, combustion with heavy smoke always indicates loss, and as many millions of dollars are spent annually for coal, even a small saving per locomotive would make a large sum in the aggregate. The property of the railway adjacent to the track, such as stations, bridges, signals, telegraph lines, etc., is damaged and deteriorated by smoke, requiring large expenditures for renewals, as well as for maintenance, such as painting and cleaning. The possibility of largely reducing the expenses for the items above mentioned, without reference to the viewpoint of esthetic or personal comfort, has been a sufficient incentive to cause the railway people to give the smoke subject a large amount of consideration. This personal interest, the interest of the community (which, I assure you, is regarded to a much greater extent than is generally supposed), added to the possibility of the savings mentioned above, has led to almost continuous study of the locomotive smoke problem. This study has extended over 25 years to my personal knowledge, and from the records, many years farther back.

"During the last 15 years I have examined drawings and patents of many devices which were supposed to eliminate smoke, and have made personal observations of their performance. Unfortunately but very few of these were even promising, and if worthy of installation and trial, the results obtained were not such as to warrant using the apparatus in regular service. The Pennsylvania Railroad system has devoted a great deal of attention, and expended a large amount of money in experimenting with and deyeloping, either on its own account, or in co-operation with representatives of other railways, or the technical societies, devices which gave promise of reducing the smoke from locomotives, and in 1910 the management sent a committee of three to Europe to study conditions and results obtained with the various devices and methods in use there, for comparison with the practice in this country. For many years devices designed to admit steam or air into the locomotive firebox have been used as a means for reducing smoke, with generally unsatisfactory results.

"During the past year, however, a device for supplying air to the firebox was developed and subjected to rigid and painstaking scientific study. Tests were made at the locomotive testing plant of the Pennsylvania Railroad, and the results were confirmed by carefully watching the performance of the locomotives in regular service. This device considerably reduces the amount of smoke under some conditions, and the results obtained so far are sufficiently promising to permit extending its use, especially for the smaller locomotives.

"During the past nine years there has been developed on the Pennsylvania Lines West of Pittsburgh a device which, up to the present time, is the most promising yet produced for the reduction of smoke, and in fact under favorable conditions, the practical elimination of locomotive smoke. I refer to the locomotive stoker, with which 154 locomotives have been equipped and 140 more are under construction. With this stoker we have succeeded in greatly reducing the amount of smoke emitted by locomotives in heavy passenger train, freight and switching service. Repeated comparisons of the smoke made by locomotives with and without the stoker show that those equipped with the stoker may be operated with from one-tenth to one-fourth of the smoke made by similar locomotives in the same service without the stoker.

"As stated above, this is the result of nine years' experimentation and development, but now while the apparatus is sufficiently developed to warrant the trial of a large number, the problem of maintaining, and satisfactorily operating them, with various kinds of coal, is still before us.

"What does this mean to you as to reducing the annoyance from locomotive smoke? Only this—that there are now in existence two devices for reducing the smoke from locomotives which are sufficiently promising to make it probable that the use of them will be extended, and that the information obtained from them is likely to lead to the development of others.

"In addition to the study and development of mechanical devices for the elimination of smoke, the railways, by additional supervisors and instructors, are causing reduction in the amount of smoke emitted, by having more careful firing and handling of locomotives by the enginemen, and are making a comprehensive study of the problem of reducing the amount of smoke about engine houses, where fresh fires are made, the smoke from which is the most difficult to control.

"All of this shows that the railways are keenly interested in this subject, and in addition thereto the American Railway Master Mechanics' Association has a committee studying the problem, and the railways are also co-operating with the various other associations and city officials interested."

PROPOSED LINE FROM ARGENTINA TO BRAZIL.—D. Fernandez has again petitioned Congress for a concession to build and work a railway from Reconquista in the Province of Santa Fe to Uruguayana in Brazil.

DOUBLE TRACKING ON SOUTH-EASTERN RAILWAY, RUSSIA.—The South-Eastern Railway has started laying a second track for 70 miles between Griasy and Lisky, on the Kozloff-Rostov branch. The company has been authorized to purchase 1,000 covered freight cars to raise the freight rolling stock to the number required by the Minister of Ways of Communication. To meet these expenses the company has assigned $1,905,500, advanced from the cash fund of the company, which must be later covered by a loan.

CANTON-HANKOW RAILWAY, CHINA.—The section of the Canton-Hankow railway from Canton to Yingtak was ceremonially opened on May 25. The event marks the completion of the first 100 miles from the southern end of the line. The total length of the line is approximately 730 miles. The Kwangtung section, about 209 miles in length, is being built by the Kwangtung Mercantile Administration of the Yuet-Han Railway, a Chinese company. The first 65 miles of the route from Canton were opened to traffic at the end of 1911. Since then there have been many hitches. At Yingtak, the scene of the opening festivities, a bridge consisting of six spans has been constructed. There is another bridge of 750 ft. in length at the one hundred and fiftieth mile, now under construction, and a tunnel about 1,000 ft. in length at mile 160.

General News.

The trains of the Wheeling & Lake Erie no longer run to the Union station in Toledo, the passenger business now being done at the Cherry street station. These trains have used the Union station for the past ten years.

It is announced at Washington, that the Bureau of Standards of the Department of Commerce, is to make a study of failures of car wheels and axles, taking as a text the records of train accidents kept by the Interstate Commerce Commission.

In the wreck of a west bound passenger train on the Canadian Pacific near Ottawa, Ont., on the 8th of June, eight passengers were killed and a large number injured, some of them fatally. The train was running at moderate speed on an embankment adjacent to the Ottawa River and two of the eight cars of the train fell into the water, and some of the victims were killed by drowning. The passengers were emigrants from the British Isles, bound for Western Canada.

The Chicago Great Western, through Asa G. Briggs, has announced that since the Supreme Court, in the Minnesota rate cases, had held the rates confiscatory with regard to the Minneapolis & St. Louis, that it was the opinion of the Chicago Great Western that the same would be held to be the case with that company and that, therefore, the company would not pay refunds on excess charges during the period of rate litigation. The amount involved is understood to be about $300,000.

The motormen and conductors employed by the Philadelphia Rapid Transit Company, Philadelphia, have had their pay increased. The new scale provides a maximum rate of 29 cents an hour for men who have been in the employ of the company for five years and over, while new men receive 23 cents with 1 cent additional for each year of service. In June, 1911, following the strike of 1910, the maximum rate was 23 cents an hour. The increase has come through the setting apart of a certain percentage of the company's income.

At a meeting of the special committee of the National Association of Railway Commissioners, held in Chicago on June 28, it was decided that the state commissions would furnish all assistance possible to the Interstate Commerce Commission in its work of appraising railway property. The statistics in possession of the state commissions relative to the physical valuation of railways will be placed at the disposal of the commission's valuation engineers, and representatives of the different commissions will attend meetings of these engineers. The meeting was attended by commissioners representing the states of Wisconsin, Ohio, Iowa, Oklahoma, Minnesota, Kansas, Illinois, Michigan and Nebraska.

Elisha Lee, chairman, representing the forty-five Eastern railroads to which were presented the demands of the conductors and trainmen last May, asking for a 20 per cent. increase in wages, has issued a brief notice to the public, calling attention to the fact that the roads have refused to grant the increases and that the conductors and the trainmen are now taking a strike ballot. These men, who ask for 17 millions of dollars now, received 30 millions in 1910. The conductors and the trainmen were the first to receive an advance in pay in the cycle of increases which was completed two months ago, when the firemen received an increase of some 10 per cent. The conductors and trainmen, following the example of the enginemen and the firemen, offered to arbitrate "under the law." The railroads, acting in conjunction with brotherhood leaders, are now endeavoring to have Congress amend the law, under which questions of wages on interstate railroads may be adjusted, by providing for more than three arbitrators in each case.

W. F. M. Goss, dean and director of the College of Engineering, University of Illinois, has been elected chief engineer of the Chicago Association of Commerce committee for the investigation of smoke abatement and electrification of railway terminals, to succeed the late Horace G. Burt. Dr. Goss will be granted leave of absence from the university for one year, during which time it is believed that the investigation will be completed and a report of the committee's conclusions issued. He has been a member of the committee since its organization three years ago. Dr. Goss was born at Barnstable, Mass., in 1859, and was educated at the Massachusetts Institute of Technology, at Wabash College and at the University of Illinois. He organized the department of practical mechanics at Purdue University in 1879, and was professor of experimental engineering, dean of the schools of engineering and director of the engineering laboratory at Purdue from 1890 to 1907. He has held his present position at the University of Illinois since September, 1907. He has been president of the Western Railway Club and a member of the principal technical societies; and he has taken an active part in the work of the Master Car Builders' Association. A portrait of Dr. Goss was published in our issue of June 20, 1911, page 1568.

A Big Disturbance from a Small Accident.

The detention of a train of the Brooklyn Rapid Transit Company on a trestle bridge over Jamaica Bay, between Rockaway Beach and Brooklyn, N. Y., on Sunday night, June 29, is said by the newspapers to have marooned more than 30,000 passengers at Rockaway Beach. Two cars of the train were damaged by fire, which was started by a short circuit, and the bridge itself was somewhat damaged so that no trains could be run until the next morning. A number of passengers, alarmed by the fire, jumped into the bay, but landed in shallow water or mud so that there were no serious bodily injuries. A large number of following trains were stalled on the bridge and passengers had to walk long distances on the trestles in order to find other means of transportation. It was estimated that over 3,000 passengers reached their homes in Brooklyn and Manhattan by way of Jamaica, these crowds passing through Jamaica on street cars between midnight and 3 a. m.

A relief train was sent out but it worked under great difficulties. After the passengers were disposed of, the train crew gave their attention to fighting the flames. Barrels of water, with firepails, were the only fire-fighting appliances at hand.

Thousands of people who had lingered at Rockaway Beach until a late hour were forced to spend the night on the sands. The police station was thrown open to the women and children, and many of the private residences sheltered persons unable to find room in the hotels, which did a rushing business, some of them charging as high as $5 for a single room. The police reserves of the Rockaway station were called out to maintain order. Several residents who owned motor trucks coined money at the height of the rush by taking people from the beach to Jamaica, charging $1.50 per passenger for the trip, and loading their vehicles each time. Finally the Long Island Railroad ran a special train from Rockaway Beach to Jamaica by way of Far Rockaway and Valley Stream, which relieved conditions.

Flood Damages.

Someone in Ohio estimates that the aggregate amount of the losses sustained in that state and in Indiana in consequence of the floods of last March, is more than $11,000,000, as follows: Baltimore & Ohio, $3,000,000 (including the C. H. & D.); Big Four, $2,500,000; Pennsylvania, $1,640,000; Toledo & Ohio Central, $200,000; Norfolk & Western, $526,500; Chesapeake & Ohio, including the Hocking Valley, $300,000; Erie, $600,000; Lake Erie & Western, $300,000; Vandalia, $342,000; Grand Rapids & Indiana, $28,000.

The Wheeling & Lake Erie also was a heavy sufferer from the floods, but figures have not been given out.

The Pennsylvania's Accident Record.

Of Pennsylvania Railroad employees in train service, in 1912, one in 516 were killed; of 61,443 men employed, 119 killed. Seventeen of these were killed in accidents to trains. There were 68,000 men employed in shops and on the tracks, and of this number 166 were killed by accident, none of which was a collision or derailment.

Freight trains on the Pennsylvania ran 32,114,305 miles in 1912, and passenger trains over 40,000,000 miles; and 4 passengers and 17 employees were killed in train accidents. The greatest "safety" problem is to find ways to protect those who won't protect themselves. On the Pennsylvania employees who knowingly take chances are subjected to "surprise tests." Records

of these tests made in 1912, over 1,100,000 of them show that in 99.8 per cent. of the cases there was perfect compliance with rules.

"The Public Be Pleased."

The Lehigh Valley has issued a general order instructing passenger conductors to inform passengers at the earliest possible moment of the cause and probable duration of all delays. On receiving information that their trains will be delayed or detoured, they must pass promptly through the trains or arrange for trainmen to do so, announcing this information and advising passengers as to the best means of proceeding on their journey. The order also extends to ticket agents, who must notify passengers and prospective passengers as to the probable duration of all delays.

General Manager T. J. Foley, of the Illinois Central, has issued a similar order. It says, in part: "A passenger train being delayed and cause unknown to passengers is very annoying to them. When passenger trains meet with unusual delays the conductor will make known the cause and probable length of delay. He will also advise the passengers if facilities for communication with friends are convenient. . . .

"After the conductor has notified the passengers of the time they will be delayed, the train must not proceed until such time has elapsed, unless he is positive all the passengers are on the train."

Automobiles Kill More Than Railroads.

A statistician of the New York, New Haven & Hartford presents figures to show that the number of people killed and injured in automobile accidents in this country far exceeds the number of persons killed by all the railroads, excluding employees and trespassers. Indeed, in the populous parts of the country he believes that the automobile casualties would probably equal if not exceed that of the railroads, even counting in employees and trespassers.

In the period of six weeks covered by this compilation from April 1 to May 13, there were 1,598 automobile accidents in this country of which record could be obtained, not including grade crossing accidents in which automobiles were hit by trains. In the 1,598 accidents 260 persons were killed, 424 persons seriously injured, and 1,148 persons slightly injured; total killed and injured 1,832. Taking April as an average month and multiplying by 12 would give 2,340 persons killed and 13,624 injured in a year, a total of killed and injured of 15,964.

The report of the Interstate Commerce Commission for the year ending June 30, 1912, shows that, excluding employees and trespassers, the railroads of the country cost the lives of 1,468 persons and injured 14,291. Of passengers alone 270 were killed. There are 248,888 miles of railroad in this country and there were in operation in that year 60,890 locomotives.

For the compilation of automobile accidents records were obtained from every state in the union. A summary for New England and New York follows:

State.	Number of Accidents.	Fatalities.	Serious Injuries.	Minor Injuries.	Total.
Connecticut	70	17	16	54	87
Maine	3	0	2	1	3
Massachusetts	47	10	8	26	44
New Hampshire	7	1	1	3	5
Rhode Island	60	8	8	40	56
Vermont	3	0	1	3	4
Total, New England..	190	36	36	127	199
Total, New York.....	457	91	135	263	489
Total, N. E. and N. Y.	647	127	171	390	688

In the six New England states in these six weeks there were 190 automobile accidents costing the lives of 36 persons and injuring 163. The New York, New Haven & Hartford reported that in ten years only 29 passengers in all lost their lives while traveling on its trains, though these trains covered 158,531,541 miles.

In the country as a whole there were in the six weeks covered 25 automobiles involved in grade crossing accidents, as a result of which 9 persons were killed and 23 persons injured. In 1912, 348 persons were killed and 2,581 injured in New York state in automobile accidents, and 91 persons were killed and 845 injured in New Jersey. The 348 persons killed in New York state exceed the number of passengers killed in a year on all the railroads in the United States.

Valuation Committees for the Pennsylvania.

To facilitate the preparation of the necessary data to co-operate with the Interstate Commerce Commission in its valuation of the railways, and to consider the various problems involved, the Pennsylvania system has appointed valuation committees for the Lines East of Pittsburgh, and the Lines West of Pittsburgh, which are authorized to call upon all the departments of the company for any information needed in connection with the work. The committees are composed of the following:

Lines East of Pittsburgh: L. R. Zollinger, engineer, maintenance of way, chairman; E. B. Temple, assistant chief engineer; C. M. Bunting, comptroller; A. W. Gibbs, chief mechanical engineer; F. L. Ballard, assistant solicitor; C. A. Preston, valuation engineer, and secretary of the committee.

For the Lines West of Pittsburgh: W. C. Cushing, chief engineer, maintenance of way, Southwest System, chairman; D. F. Crawford, general superintendent motive power, Pennsylvania Lines; G. C. Urquhart, real estate agent, Pennsylvania Lines; John Hurst, assistant comptroller, Pennsylvania Lines; F. T. Hatch, chief engineer, Vandalia; E. H. Barnes, chief engineer, Grand Rapids & Indiana; W. D. Wiggins, valuation engineer; C. W. Garrett, secretary of the committee.

The valuation engineers are charged with the general administration of the work, under the supervision of their respective committees. A photograph and sketch of Mr. Preston was published in the issue of June 20, page 1589.

Chicago Terminal Plans.

The Chicago city council committee on railway terminals has decided to employ John F. Wallace, to make an expert investigation of the various proposed plans for the erection of new railway terminals in Chicago, before passing on the ordinance asked by the roads using the old Union Station to enable the carrying out of their plans for a station between Jackson boulevard, Adams street, Clinton street and the Chicago river. At a meeting of the council on Monday night the committee was authorized to expend $10,000 for the investigation, but it is said that this is only a preliminary appropriation.

The Union Station Company inserted in all the Chicago papers on Monday last a two-page advertisement headed, "What the Proposed West Side Terminal Means to the People of Chicago." The advertisement included large photographs of various views of the proposed passenger station and the Pennsylvania freight terminals, and quoted resolutions adopted by the Chicago Real Estate Board endorsing the station plan, and an extract from an article written by John F. Stevens, citing objections to a single union station.

Proposed Electrification of an Austrian Railway.

It is proposed to electrify the Arlbergbahn, Austria. This railway lies between Bludenz and Landeck, crossing the Arlberg. The average grade on one section is 23.3 per cent., the maximum is 31.4 per cent. There is only one track, except in the tunnel, which has a double track. The total length of the line is 40 miles. As a line of this description is hard to work with steam, especially when the fuel has to be carried from great distances, whilst, on the other hand, there is plenty of water power, it is not surprising that the electrification of the railway should have been frequently proposed during the last 13 years. Until now, however, all the different schemes failed owing to the high cost of the power plant. As the latter has to be extremely powerful in order to be equal to the demands made on it during the season of dense traffic, there would be a great waste during normal traffic, as the excess power could not be sufficiently utilized. The new project for electrification is to remedy this disadvantage. It is proposed to enlarge the power plant already existing for the working of the Mittenwald Railway in proportion to requirements. This power plant is situated at a distance of about four miles south of Innsbruck, using the water power of the Ruetzbach, a tributary of the river Sill.

Railway Fire Protection Association.

This is the name which has been chosen by a number of railway officers, interested in fire insurance, for an association which they hope to establish, and concerning which they propose to

have a meeting in Chicago, October 7, for the purpose of arranging a permanent organization. A conference was held in New York City, May 14; and at another meeting, in Washington, June 2, a constitution and by-laws were drafted. The purpose is to promote interest in the best methods of protection against fire and also prevention; and to circulate information and standardize practices. Invitations have been sent to the principal railroads of the United States, Canada and Mexico. The provisional committee consists of the following six men, the first of whom is chairman and the last the secretary: F. H. Elmore, Southern Railway; E. B. Berry, Southern Railway; A. D. Brooks, Illinois Central; B. S. Mace, Baltimore & Ohio; Robert Scott, Atlantic Coast Line; C. B. Edwards, Mobile & Ohio. The office of the Secretary is at Mobile, Ala.

The Tinners, Etc., Association.

The Railroad Master Tinners', Coppersmiths' and Pipe Fitters' Association was organized at a meeting in St. Louis, on June 24, with about 25 charter members, for the purpose of interchanging ideas on shop management and efficiency. At this first annual meeting papers were read on "Railroad Tinware," "Shop Economy," and "Apprentices." Officers were elected as follows: President, C. B. Baker, of the Terminal Railroad Association of St. Louis; first vice-president, J. S. Richards, of Houston, Tex.; second vice-president, W. J. Moffit, of Indianapolis; third vice-president, W. F. Warren, of Chicago; secretary-treasurer, U. G. Thompson, of Danville, Ill.

International Electrical Congress, 1915.

A committee of the American Institute of Electrical Engineers is making plans for an international electrical congress to be held at San Francisco in September, 1915, in conjunction with the Panama Pacific International Exposition. The congress will begin September 13; and in the week preceding there will be a meeting of the International Electrotechnical Commission. The secretary of the committee on organization is Dr. E. B. Rosa, Bureau of Standards, Washington, D. C.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass. Convention, May 19, 1914, St. Louis.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York. Annual meeting, October 14-15, Philadelphia, Pa.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, St. Louis, Mo.; 3d Friday of March and September.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOC.—H. G. McConnaughy, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York. Next meeting, November 19, 1913, Chicago.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Convention, October 21-24, 1913, Montreal.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—A. R. Davis, Central of Georgia, Macon, Ga. Next convention, July 22-24, Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.

AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wenlinger, 11 Broadway, New York; 2d Tuesday of each month, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Next convention, January 20-22, 1914, New Orleans, La.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago. Annual meeting, May 28, Atlantic City, N. J.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago. Annual convention, October 18-24, Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 112 West Adams St., Chicago.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.

ASSOCIATION OF WATER LINE ACCOUNTING OFFICERS.—W. R. Evans, Chamber of Commerce, Buffalo, N. Y. Annual meeting, October 8, Philadelphia, Pa.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—H. A. Neally, Joseph Dixon Crucible Co., Jersey City, N. J. Meeting with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursday, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, Oliver building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. G. Hall, 922 McCormick building, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 829 West Broadway, Winona, Minn. Next convention, July 15-18, Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio. Annual meeting, August 18, Richmond, Va.

MAINTENANCE OF WAY & MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—W. G. Wilson, Lehigh Valley, Easton, Pa.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Annual meeting, September 9-12, Ottawa, Can.

NATIONAL RAILWAY APPLIANCE ASSOC.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.

NORTHERN RAILROAD CLUB.—C. L. Kennedy, C., M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, Union Station, Peoria; 2d Thursday.

RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 2 Rector St., New York. Annual dinner, second week in December, 1913, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.

RAILWAY GARDENING ASSOCIATION.—J. S. Butterfield, Lee's Summit, Mo. Next meeting, August 12-15, Nashville, Tenn.

RAILWAY DEVELOPMENT ASSOCIATION.—W. Nicholson, Kansas City Southern, Kansas City, Mo.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa. Convention, October 14, Nashville, Tenn.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOC.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. Assocs.

RAILWAY TEL. AND TEL. APPLIANCE ASSOC.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.

RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling, Ill. Convention, September 8-12, 1913, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillsburn, N. Y. Meeting with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago.

TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N Y. Annual meeting, August, 1913, Chicago.

UTAH SOCIETY OF ENGINEERS.—R. B. Ketchum, University of Utah, Salt Lake City, Utah; 3d Friday of each month, except July and August.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month, except July and August, Chicago.

Traffic News.

Railways operating in Iowa have decided to contest the validity of the law passed by the last session of the legislature providing for a maximum fare of 1½ cents per mile in each direction, for the transportation of passengers to county fairs and other gatherings where the attendance is 75,000 or more.

Commissioner Kennish, of the Missouri Public Utilities Commission, has rendered a ruling that free transportation over Missouri railways, except that allowed by the new utilities law, will become invalid on July 31, although issued before that date. The ruling applies to passes which may have been issued for services or in place of money compensation.

According to a press despatch from El Paso, Tex., a traffic agreement has been made between the Southern Pacific, the Kansas City, Mexico & Orient, and the Missouri Pacific, by which through freight between the Missouri river and the Pacific coast will be taken over the K. C. M. & O. This road connects with the Southern Pacific at Alpine, 223 miles east of El Paso, and with the Missouri Pacific at several points.

The Southern Railway, through its Live Stock Department, has issued a booklet entitled, "Hog Production and Conditions for Success in the South," a copy of which will be furnished on request by F. L. Word, Live Stock Agent, Atlanta. The booklet contains practical and valuable information for farmers as to care of hogs, selection of breeds, etc. The South consumes more pork and raises less than any other part of the United States despite the fact that pork can be produced more cheaply in the South than in the North or West.

The Western Maryland now runs trains through, to and from Chicago, the connection from Connellsville, the western terminus of the Western Maryland, being over the Pittsburgh & Lake Erie and the Lake Shore & Michigan Southern. The Chicago Limited express leaves Baltimore at 9:25 a. m. and reaches Chicago at 7:59 a. m.; the Baltimore Limited leaves Chicago at 8:20 p. m. and reaches Baltimore at 7 a. m. Good through connections are made also by trains leaving Baltimore in the evening and Chicago in the morning.

Among the non-railroad organizations which are helping the farmers is the Kansas Bankers' Association, which has formed a special committee to organize bankers, in each county of the state, into county associations, with a view to assisting the farmers in their efforts to introduce scientific farming. The scheme of the bankers includes a plan for lending money for use in experiments.

In Hampden county, Massachusetts, the Hampden County Improvement League has been organized and has established an office in Springfield, which, with the aid of representatives of the Massachusetts Agricultural College, will be made to serve as a headquarters from which agents will go out to travel around the county, to give advice to the farmers. John A. Scheuerle is the secretary of the League. On one day of each week the field workers will be at the office in Springfield to consult with farmers and other visitors.

Car Balance and Performance.

Arthur Hale, chairman of the committee on relations between railroads of the American Railway Association, in presenting statistical bulletin No. 148 covering car balances and performances for March says:

The miles per car per day, for March were 23.7, compared with 24.7 in February. This figure for March, 1912, was 24.5.

Ton miles per car per day, for March were 374, compared with 395 in February. This is a decrease of 3.86 per cent. compared with March, 1912; the ton miles per car per day, for March, 1912, being 389.

The proportion of home cars on line increased one point to 53 per cent. in March. This figure for March, 1912, was 50 per cent.

The per cent. of loaded mileage for March decreased 0.1 per cent. to 70.0 per cent. This figure for March, 1913, was 71.0 per cent.

The average earnings per car per day for all cars on line were

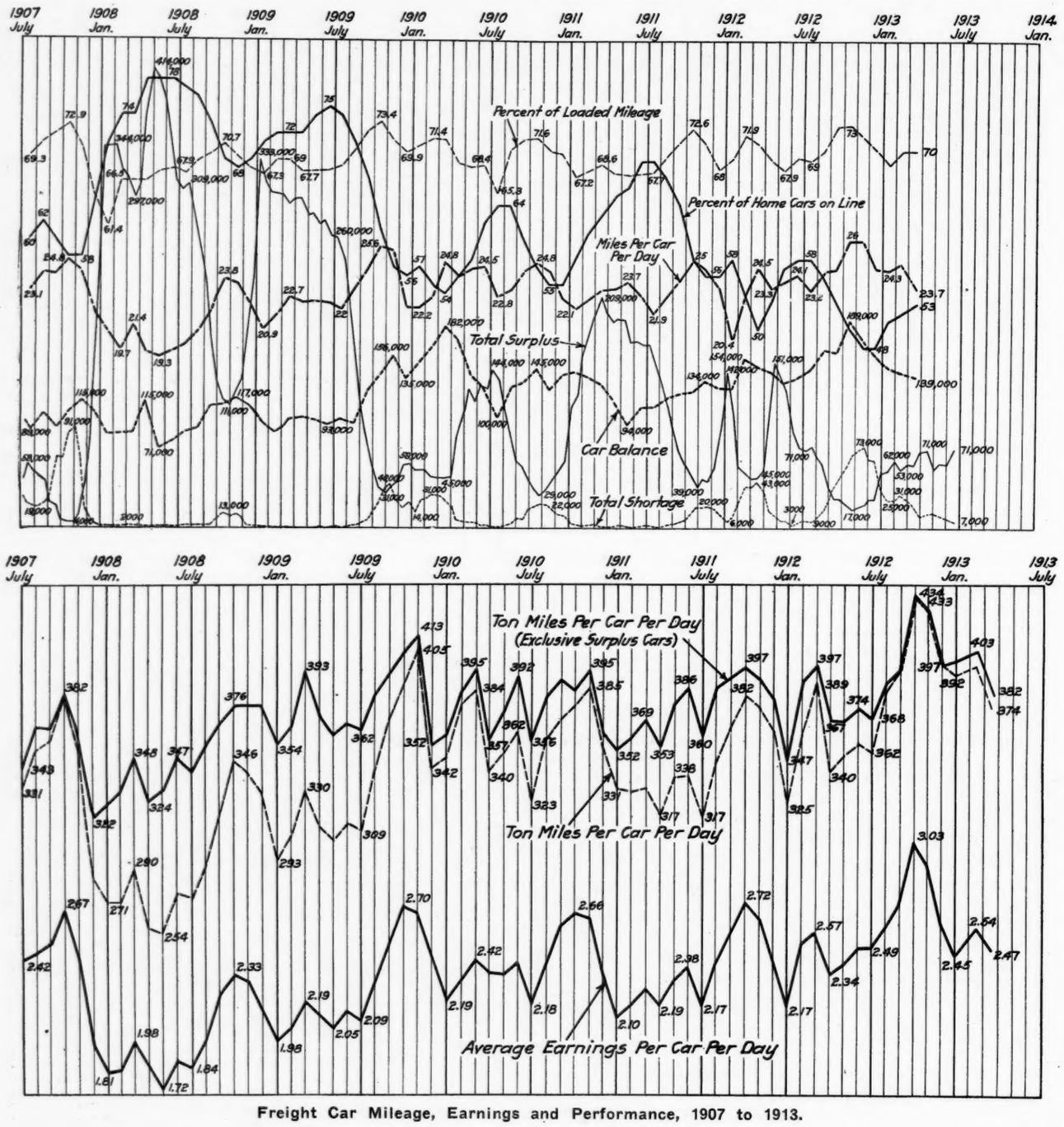
CAR BALANCE AND PERFORMANCE IN MARCH, 1913.

	New England.	N. Y., N. J., Del., Md., Eastern Pa.	Ohio, Ind., Mich., Western Pa.	Va., W. Va., No. and So. Carolina.	Ky., Tenn., Miss., Ala., Ga., Fla.	Iowa, Ill., Wis., Minn.	Mont., Wyo., Neb., Dakotas.	Kan., Colo., Okla., Mo., Ark.	Texas, La., New Mex.	Ore., Idaho, Nev., Cal., Ariz.	Canadian Lines.	Grand Total.
Revenue freight cars owned	89,366	681,104	220,886	189,142	161,856	421,552	18,274	144,004	29,301	135,591	121,201	2,212,277
Average number of system cars on line	42,221	340,074	112,347	97,359	69,932	266,761	4,741	65,534	18,379	60,821	78,143	1,156,312
Railway-owned cars: Average foreign on line	55,326	308,789	112,306	92,693	78,349	170,300	11,898	70,142	22,234	49,189	51,925	1,023,151
Total Railway-owned cars on line	97,547	648,863	224,653	190,052	148,281	437,061	16,639	135,676	40,613	110,010	130,068	2,179,463
Excess	8,181	*32,241	3,767	910	*13,575	15,509	*1,635	*8,328	11,312	*25,581	8,867	*32,814
Per cent. of cars on line to total owned:												
Home	47	50	51	51	43	63	26	46	63	45	64	53
Foreign	62	45	51	49	49	41	65	44	76	36	43	46
All railways	109	95	102	100	92	104	91	90	139	81	107	99
Private cars on line	3,651	35,563	10,310	6,424	8,782	14,759	1,744	7,902	3,853	12,126	3,124	108,238
Total, all cars on line	101,198	684,426	234,963	196,476	157,063	451,820	18,383	143,578	44,466	122,136	133,192	2,287,701
Per cent. of cars in shop	6.06	5.55	8.86	5.70	9.01	5.77	6.35	7.32	6.04	5.66	5.01	6.40
No. of freight engines owned	1,460	10,388	3,162	3,468	2,778	6,968	545	2,850	859	2,783	1,934	37,195
Average cars on line per freight engine owned	69	66	74	57	57	65	34	50	52	44	69	62
Total freight car mileage	57,820,429	507,010,550	140,846,922	144,121,738	124,652,137	323,280,570	24,215,409	99,401,639	37,542,000	118,629,332	95,311,153	1,672,831,879
Average mileage per car per day	18.4	23.9	19.0	23.7	25.7	23.1	43.4	23.6	27.6	31.3	23.1	23.7
Per cent. loaded mileage	73.6	67.4	70.9	68.5	72.5	71.1	76.4	68.3	63.2	69.9	78.5	70.0
Ton-miles of freight, including company freight	689,294,703	8,442,913,132	2,275,375,654	2,333,640,892	1,867,708,385	3,861,703,325	370,161,198	1,392,077,643	394,278,540	1,765,336,678	1,728,806,991	25,121,297,141
Average ton-miles, including company freight:												
Per car-mile	11.9	16.7	17.0	16.2	15.1	15.2	15.8	14.0	12.6	15.1	18.1	15.8
Per loaded car-mile	16.2	24.7	23.9	23.6	20.8	21.6	20.6	20.7	19.5	21.7	23.1	22.7
Per car per day	220	398	323	383	388	350	685	330	348	473	419	374
Gross freight earnings	$7,110,190	$47,983,259	$12,945,010	$14,431,731	$12,380,094	$33,632,184	$2,715,828	$11,664,490	$3,934,478	$16,836,367	$10,739,990	$174,373,621
Average daily earnings: Per car owned	$2.57	$2.27	$1.89	$2.46	$2.47	$2.57	$4.79	$2.56	$4.33	$4.02	$2.86	$2.54
Per railroad car on line	2.35	2.39	1.86	2.45	2.69	2.48	5.27	2.85	3.13	4.96	2.66	2.59
All cars on line	2.27	2.26	1.78	2.37	2.54	2.40	4.77	2.71	2.85	4.58	2.60	2.47

*Denotes deficiency.

$2.47, compared with $2.54 in February. This figure for March, 1912, was $2.57.

The table on page 29 gives the car balance and performance in the month covered by the report and the diagram shows



Freight Car Mileage, Earnings and Performance, 1907 to 1913.

lars' worth passed from the eastern coast to the western coast of the United States and Hawaii, and 12 million dollars' worth to foreign countries, while 39 million dollars' worth of products of the Pacific coast and Hawaii moved eastward to the Atlantic

car earnings and car mileage and different car performance figures monthly from July, 1907.

Traffic Over the Isthmus of Panama.

The Department of Commerce reports the value of freight carried over the Tehuantepec and Panama railroads during the twelve months ending June 30, as 132 million dollars, a decrease of about 10 millions as compared with 1912. No tonnage figures are reported, but it is said that the decrease in value is largely due to lower prices of sugar from Hawaii, which moves in large volume over the Tehuantepec Railroad. In westbound traffic the total is 5 millions greater in 1913 than in 1912. Of the merchandise crossing the isthmuses in 1913, 75 million dollars' worth passed from the eastern coast to the western coast of the United States and Hawaii, and 12 million dollars' worth to foreign countries, while 39 million dollars' worth of products of the Pacific coast and Hawaii moved eastward to the Atlantic and gulf ports of the United States and 5½ million dollars' worth to foreign countries. The remarkable growth in this transisthmian traffic has occurred chiefly since the opening of the Tehuantepec Railroad January 1, 1907. The goods carried over the Panama Railroad in 1906 were valued at only $6,000,000.

98,000,000,000 Feet of Timber.

Bids have been received by the Forest Service at Washington for 300 million feet of timber which has been advertised for sale on the Tongass National Forest in Alaska, and an additional 300 million feet from the same forest has been applied for. A large part of this timber is Sitka spruce, which will be made into paper

pulp for the Pacific Coast and the Orient, and for the general pulp market.

The latest estimates available show that there is a stand of approximately 70 billion feet of timber on the Tongass National Forest and approximately 28 billion feet on the Chugach National Forest in Alaska. When timber is sold the government allows a cutting period of twenty years, with two years additional for construction work. The prices may be adjusted at five-year intervals to take care of possible advances in lumber values.

14,313,015 Bales of Cotton in 1912.

The Census Bureau calculates that the cotton crop of the United States for 1912 was the second largest ever produced and amounted to 14,313,015 bales of 500 lbs. each. The figures show a slight increase over the preliminary statistics announced March 20. Seed was produced to the extent of 6,104,000 tons, of which 4,579,508 tons were taken by the oil mills, leaving 1,524,492 tons for planting, export, feeding and other purposes.

The 1912 crop graded "middling to strict middling," and the average price of upland cotton was 12.05 cents per pound. Insect pests seriously affected the crop, growers in a large section having to contend with the boll weevil, cotton caterpillars and grass worms. The boll weevil area showed considerable extension, but work by the federal and state agricultural departments is greatly reducing the destructiveness of the pest.

INTERSTATE COMMERCE COMMISSION.

Washington, D. C., Discriminated Against.

Washington, D. C., store-door delivery. Opinion by Commissioner Marble:

For many years store-door delivery of certain classes of property transported from designated points has been given at Baltimore, Md., and Washington, D. C. The carriers now propose to withdraw this service at Washington and to continue it at Baltimore. The commission decided that the service must be continued at Washington so long as it is continued at Baltimore. (27 I. C. C., 347.)

Rates on Corn Milled at Oneonta, N. Y.

In re investigation and suspension of new milling-in-transit regulations applicable on the products of corn milled or mixed at Oneonta, N. Y. Opinion by Commissioner Clements:

Under present tariffs corn with other grain originating at Chicago may be milled at Oneonta, N. Y., on the Delaware & Hudson, on basis of the joint through rate on the product from Chicago to final destination. By the tariff under suspension the Delaware & Hudson proposes to cancel this basis of transit rates on corn when its products are forwarded from Oneonta to points on the Boston & Maine, which would have the effect of increasing the basis of charge on such grain to the combination of the local rates to and from Oneonta. The proposed change was not found to be justified and the commission ordered the suspended tariff cancelled. (27 I. C. C., 367.)

Banana Rates Reduced.

Topeka Traffic Association v. Alabama & Vicksburg et al. Opinion by Chairman Clark:

The commission found that the present rate of 80 cents per 100 lbs. for the transportation of bananas from New Orleans, La., to Topeka, Kan., is unjustly discriminatory to the extent that it exceeds the rate contemporaneously applied on like traffic from New Orleans to Lincoln or Beatrice, Neb., which is 71 cents per 100 lbs., and that the rate of 70 cents per 100 lbs. for the transportation of bananas from Galveston, Tex., to Topeka is unjustly discriminatory to the extent that it exceeds the rate contemporaneously maintained to Beatrice or Lincoln, which is 62 cents per 100 lbs. Those rates were prescribed for the future. (27 I. C. C., 428.)

Rates on Lumber Reduced.

Cherokee Lumber Co., et al., v. Atlantic Coast Line, et al. Opinion by the commission:

The complainants alleged that the local and proportional rates of the initial carrier on lumber from their mills at points on the Atlantic Coast Line between Fayetteville and Wilmington, N. C., to Norfolk, Pinners Point, Portsmouth, Petersburg and Manchester, Va., are unreasonable to the extent that they exceed the rates from certain competitive points. Reparation is asked. The present rates from points on the Atlantic Coast Line south of Fayetteville to the Virginia stations in question is 10.5 cents per 100 lbs. The rates from points on the same railroad north of Fayetteville on the Sanford line is 9 cents per 100 lbs. The commission decided that this practice was discriminatory and ordered the defendants to maintain rates from the points between Fayetteville and Wilmington to the Virginia cities in question which shall be no higher for equal distances than those contemporaneously maintained to the same destinations from points between Sanford and Fayetteville. No reparation was awarded. (27 I. C. C., 438.)

Rates on Tin Cans, Petroleum, and Other Commodities.

In re investigation and suspension of advances in rates by carriers for the transportation of tin cans and other commodities between points in the state of California and points in other states. Opinion by Commissioner McChord:

The commission decided that the proposed advances on tin cans, grape, berry and fruit baskets and empty carriers, returned between California and other points in other states, had not been justified. The present rates will continue in effect, pending the establishment of a reasonable adjustment.

The tariffs also provide for the transportation of petroleum, crude oil, petroleum gas oil, petroleum road oil, petroleum stove oil, petroleum residuum and fuel oil, under class D instead of under fifth class, when shipped in straight carloads. While under this arrangement the rate on carload shipments is reduced, the elimination of the mixing privilege makes some advances possible when mixed carloads are shipped. The complainants offered no particular objection to this item, and in view of the material reductions it provides, the commission permitted it to become effective without prejudice to any attack that might hereafter be made upon the charges resulting from the elimination of the mixing privilege. (27 I. C. C., 298.)

Conference Rulings.

The following rulings have recently been adopted by the Interstate Commerce Commission in conference:

A person who has a contract to furnish ties to a railroad may not lawfully use free transportation as inspector of those ties.

Conference ruling 258, which provides for a time limit of 30 days within which uncollected undercharges may be brought to the attention of the commission for authorization of waiver of such undercharges, was amended to extend the time limit to 90 days.

Officers and employees of the Panama Railroad are government employees and not entitled to free passes from other railroads.

Paragraph 1,863 of the Commission's Regulations for the Transportation of Dangerous Articles by Freight was amended to read as follows: When cylinders containing inflammable gases are not boxed or crated for shipment, the safety device and discharge valve must be made safe from injury during transit by a design and construction of the cylinder or they must be protected by strong metal caps that cannot be detached by rolling the cylinder. Carload or large less-than-carload lots loaded by the shipper to be unloaded by the consignee, may be transported without crating or boxing, provided the cylinders are loaded compactly in an upright position and are securely braced to prevent any relative movement during transit, according to the general methods prescribed by B. E. pamphlet No. 6 for bracing shipments of explosives.

Shipper liable for his error in marking his l. c. l. shipments. Besides being expressly so provided in the rules of all freight classifications it is on broad general grounds the duty of a shipper correctly to mark packages of less than carload freight intended for transportation; and when so marked the carrier is held to a strict responsibility for their safe delivery at destination. In a case where a package of merchandise was addressed by the shipper to Lake City, Fla., instead of Lake City, S. C., it is held, that the shipper making the error must bear the burden of the resulting freight charges; and the fact that

the correct address was noted on the bill of lading is not material. *Parlin & Orendorf Plow Co. v. U. S. Express Co.*, 26 I. C. C., 561, reaffirmed.

Missouri River-Illinois Wheat and Flour Rates.

In re investigation and suspension of advances in rates by carriers for the transportation of wheat from Kansas City, Mo., and other points, to Edwardsville, Ill., Lawrenceville, Ill., and other points. Opinion by Commissioner Meyer:

The rate schedules under suspension propose to cancel joint rates on grain from the Missouri river to milling points in southern Illinois. Should the proposed cancellation become effective southern Illinois country mills would be placed at a disadvantage as compared with mills at St. Louis and similar rate-breaking points in the movement to seaboard and southern territory.

The commission found that the rates involved must be considered as parts of the total transportation charge from western grain fields to seaboard and southern territory. Southern Illinois millers should be treated upon a substantial equality with St. Louis on the movement to the east and to the south.

An advance in the total transportation charge to these mills cannot be predicated upon a dispute regarding divisions.

If the breaking of rates is to be restricted to St. Louis and other river crossings and so-called primary markets, the substantial equality above indicated must be provided by milling-in-transit provisions or otherwise for all mills along the direct route to the East and to the South. An alternative is to eliminate the proportional and reshipping rates and establish through rates from the grain fields.

Unless the carriers file tariffs providing milling in transit at a charge not to exceed one-half cent per 100 lbs. in connection with rates from East St. Louis to the seaboard, or otherwise provide for the rate relationship above indicated, suspension of the schedules which provide for the cancellation of the 9-cent rate will be made permanent. The schedules providing for the cancellation of the 13-cent rate to Illinois Central points were permanently suspended. (27 I. C. C., 286.)

Rates on Spokes Reduced.

Eastern Wheel Manufacturers' Association et al. v. Alabama & Vicksburg. Opinion by Commissioner Meyer:

Complaint is made against the assessment of charges higher than the lumber rates for the shipment of club-turned spokes originating south of the Potomac and Ohio rivers and in the southwest to points in Trunk Line territory and also to points south of the Ohio and the Potomac and in the Southwest. A large number of wood articles analogous to club-turned spokes move at the lumber rate. Spoke manufacturers compete with manufacturers of lumber and other wood articles in the purchase of stumpage. Certain spoke manufacturers in the South enjoy lower rates to the East than competing manufacturers in the same section and on the same railway lines. The rates to the East are almost uniformly higher than the lumber rates, while those to the West are in most instances the same.

The commission decided that the saving of freight to the consumer and loss of tonnage to the carrier due to the loss in weight in the manufacture of club-turned spokes from the rough billet is not a valid reason for increased ratings. It is unjust, unreasonable, and discriminatory to force club-turned spokes to bear higher rates than are imposed for a like service upon the many analogous wood articles which move at lumber rates.

The commission found also that the defendant's tariffs show great lack of uniformity in the manner of publishing rates on club-turned spokes and in the relation of those rates to the rates on lumber. This situation should be remedied and the change should be toward greater uniformity. Rough lumber and finished products should not be given the same rating. The differentiation, however, must be based upon correct principles of classification. The suggestion is submitted that the three classification committees publish a uniform lumber list, fixing a proper rate relationship between manufactured articles and the rough lumber from which they are made.

The commission ordered that in future the rates on club-turned spokes should not exceed the rates on oak and hickory lumber between the points in question. (27 I. C. C., 370.)

Joint Rate with the Chicago, Zeigler & Gulf Cancelled.

In re investigation and suspension of advances in rates by carriers for the transportation of coal and other commodities between Zeigler, Ill., and points in Missouri, Iowa and other states by cancellation of joint rates in connection with Chicago, Zeigler & Gulf. Opinion by Chairman Clark:

In this case the respondents proposed to withdraw joint rates on coal and other commodities in connection with the Chicago, Zeigler & Gulf between Zeigler, Ill., and various interstate points. On protest of the latter road the tariffs were suspended. In determining whether the road in question was a common carrier or a plant facility the commission found that it originated in the necessity to provide means to operate the Zeigler coal mines and that substantially all its mileage is the necessary adjunct of a coal company and its high cost of construction was mainly due to the filling and grading required to transform a level prairie into a gravity yard. The commission found also that it was a common carrier to none but its only patron, the mining company; also that it had no equipment in which to carry interstate commerce. If the mining company ceased operation it is plain that the railroad would likewise be dormant. The commission decided that the service performed by the road in drawing empty cars from the sidings of the line haul carriers to the mine and removing the loaded cars therefrom is private transportation. Necessarily, therefore, it may not be the recipient of divisions from joint through interstate rates on such traffic. As it is not the owner of the coal transported it may not receive an allowance for the services rendered. The allowance or division which is now received constitutes unjust discrimination against other mines served by the connecting railroads. An allowance to the Zeigler Coal Company or its lessee, the mining company, would subject other mines served by the respondents, where the circumstances and conditions are substantially similar to those at Zeigler, to undue prejudice and disadvantage. The order of suspension was vacated. (27 I. C. C., 353.)

Reparation on Lumber Shipments.

Commercial Club of Omaha v. Anderson & Saline River Railway Company et al; and 17 other cases disposed of in the report itself or the orders entered herein, wherein the parties are named, as follows: 3,501 *and intervening petition No.* 1; 3,515 *and amendments Nos.* 1 *to* 13; 3,533 *and intervening petitions Nos.* 1 *and* 2; 3,534 *and amendment No.* 1; 3,573 *and sub-No.* 1; 3,656 *and sub-Nos.* 1 *to* 13; 3,657 *and sub-No.* 1; 3,658 *and sub-Nos.* 1 *to* 107; 3,659 *and sub-Nos.* 1 *to* 52; 3,665 *and sub-No.* 1; 3,683 *and sub-Nos.* 1, 2 *and* 3; 3,695 *and sub-Nos.* 1 *to* 8; 3,790; 3,795 *and sub-No.* 1; 3,930; 3,940 *and sub-Nos.* 1 *to* 40, *and* 3,999. *Opinion by Chairman Clark:*

In *Commercial Club of Omaha v. Anderson & Saline River et al*, 18 I. C. C., 532, mentioned in the *Railway Age Gazette* of July 1, 1910, page 49, the commission decided that the rates on lumber from southern producing territory to Omaha, Neb., and Des Moines, Ia., were unreasonable, prescribed reasonable rates for the future and awarded reparation.

In the present case awards of reparation, based on the decision in the above case, are sought. The commission held that a complaint filed by an association on behalf of certain of its members who are named, and a finding the complainant's members are entitled to reparation does not include members of the association other than those named in the complaint. The mere submission of an expense bill to the commission is not proof of damage. In this case there was no record upon which the proper relationship of rates as between different groups of origin on the Kansas City Southern can be determined. The rates to Omaha, Lincoln and Des Moines having been found to be unreasonable, shipments made to those points and rebilled therefrom are, for the purpose of determining as to reparation, to be considered as having been made to those basic points locally. Where a consignee pays freight charges to the carrier and then deducts the amount thereof from the purchase price due the vendor, the consignee has not been damaged by the freight rate and cannot, therefore, be heard to claim reparation. No reparation may be allowed in a case where it has been found that the industrial road serving a consignor's plant, originating the shipment and receiving an allowance from the carriers was a

plant facility, or was a participant in the joint rate under which the shipment moved. Cases in which allegations of complaint were not substantiated or attempted to be substantiated were dismissed. Reparation was awarded to certain consignors. (27 I. C. C., 302.)

STATE COMMISSIONS.

Governor Dunne has signed the bill passed at the recent session of the Illinois legislature providing for the creation of a state public utilities commission, of five members, to receive salaries of $10,000 a year. The commission takes office January 1, 1914, and will succeed the present railroad and warehouse commission.

COURT NEWS.

The Supreme Court of Pennsylvania, in an opinion by Justice Brown, has sustained the constitutionality of the full crew law of that state, which was passed June 19, 1911. The decision follows that of the Supreme Court of the United States, in which similar laws in Arkansas and Indiana were sustained.

Judge Wright of the United States district court at Danville, Ill., on June 30, issued an order restraining the Illinois Railroad & Warehouse Commission and states' attorneys in eight counties traversed by the Louisville & Nashville in Illinois from enforcing the headlight law passed by the Illinois legislature.

In the Federal Court, New York City, June 26, the Grand Jury indicted eight men connected with well-known commission houses for fraud and collusion in presenting claims to railroads for damages to eggs in transit, the charges including averments that inspectors of the railroads had been parties to the fraud. The accused men were released on bail bonds ranging from $2,000 to $3,000 each. It is said that some of the fraudulent claims were for sums 50 per cent. larger than the actual losses in the shipments to which the claims referred.

The prosecuting attorney of Cole county, Missouri, has filed suit in the county circuit court against the Missouri Pacific charging violation of the act passed by the last general assembly requiring the equipment of locomotives with springs under the cabs. The Missouri Pacific immediately applied to the supreme court of the state for a writ of prohibition to prevent the trial of the case, on the ground that the law infringes on the jurisdiction of the Interstate Commerce Commission. The court on June 28 dismissed the application without prejudice.

Attorney-General West, of Oklahoma, has filed a motion in the United States district court to dismiss the injunction restraining the enforcement of the two-cent fare law. A general investigating committee of the lower house of the Oklahoma legislature filed a report severely criticizing the attorney-general for his policy in making a stipulation with the carriers to leave the Oklahoma rate case in statu quo, pending the decision of the Supreme Court, instead of continuing the case. The report stated that the procedure adopted had delayed a settlement. Later, on June 27, at a conference with the attorney-general, the railways agreed to establish 2-cent fares after the first week in July.

The business of the Commerce Court at Washington ceased on June 30, Congress having made no appropriation for the expenses of the court beyond the end of the fiscal year. The four judges, Knapp, Hunt, Garland and Mack, are Circuit judges of the United States, and as such continue to draw salaries, but they have no work to perform. There is still some sentiment in Congress in favor of the continuation of the Commerce Court, and it is possible that an appropriation for another year may yet be passed. Congressman Broussard, of Louisiana, has presented a strong argument in support of the usefulness of the court and calling attention to the fact that the members of the Interstate Commerce Commission desire its continuance. Appeals from decisions of the Interstate Commerce Commission have been settled on the average, by the Commerce Court, in less than half the time formerly taken for such settlement when the cases had to go to the District Courts.

Railway Officers.

Executive, Financial and Legal Officers.

E. H. Boles, general attorney of the Lehigh Valley at New York, has been promoted to general solicitor, and his former position has been abolished.

Edson Rich, general attorney of the Union Pacific for Nebraska and Iowa, with headquarters at Omaha, Neb., has also been appointed assistant general solicitor.

J. B. Duke has been appointed auditor of revenue of the Southern Railway, succeeding E. T. Jones, deceased, and T. L. Shelton has been appointed auditor of station accounts, both with offices at Washington, D. C.

C. E. Potts, assistant treasurer of the Chesapeake & Ohio, at Richmond, Va., having retired on July 1, J. A. Hancock, paymaster at Richmond, has been appointed assistant treasurer, succeeding Mr. Potts, and L. G. Burress, assistant paymaster, succeeds Mr. Hancock.

Operating Officers.

J. S. Douglas has been appointed chief despatcher of the Atlanta, Birmingham & Atlantic, with office at Manchester, Ga.

Harry Decatur Mudget, freight conductor, has been appointed trainmaster of the Montana division of the Northern Pacific, with headquarters at Livingston, Mont.

C. J. McDonald has been appointed an assistant superintendent, first division, of the Houston & Texas Central, with office at Austin, Tex., succeeding W. T. Hall, resigned.

In addition to his duties as superintendent of car service of the Chicago & Alton, F. McIntosh is appointed inspector of passenger transportation, with headquarters at Chicago, effective July 1.

R. K. Rochester, division engineer of the Vandalia at Terre Haute, Ind., has been appointed superintendent of the Peoria division, with headquarters at Decatur, Ill., succeeding W. D. Wiggins.

J. T. King, assistant general superintendent of transportation of the Atlantic Coast Line, at Wilmington, N. C., has been appointed general superintendent of transportation, with office at Wilmington.

S. V. Rowland has been appointed trainmaster of the Northern division of the Chicago Great Western, with office at St. Paul, Minn., in place of J. G. Lorton, resigned. The office of assistant superintendent is abolished.

R. C. Watkins, who recently was appointed acting superintendent of the Houston division of the Galveston, Harrisburg & San Antonio, with headquarters at San Antonio, has been appointed superintendent, succeeding J. E. Taussig, resigned to accept service with another company.

R. E. Clark, chief clerk to the assistant general manager of the St. Louis & San Francisco, has been appointed superintendent of car service of the Texas and Louisiana lines, including the New Orleans, Texas & Mexico, Beaumont, Sour Lake & Western, Orange & Northwestern and St. Louis, Brownsville & Mexico, with headquarters at Houston, Tex., succeeding J. H. Reich, resigned.

W. A. Card, superintendent of the Creston division of the Chicago, Burlington & Quincy, with office at Creston, Iowa, has been appointed superintendent of the St. Joseph division, with headquarters at St. Joseph, Mo., succeeding B. B. Greer, who has been transferred to the staff of the general manager, with headquarters at Chicago. Mr. Card is succeeded by N. C. Allen, heretofore assistant superintendent of the Aurora division at Aurora, Ill. A. J. Carter, trainmaster at Aurora succeeds Mr. Allen. Effective July 1.

G. H. Trenary, division superintendent of the Chicago & Eastern Illinois at Salem, Ill., has been appointed superintendent of the Chicago division, with headquarters at Danville, Ill. J. O. Bell, superintendent of the Evansville division at Evansville, Ind., succeeds Mr. Trenary as superintendent of the Illinois division. Mr. Bell is succeeded by E. R. Glidden. J. E. Epler has

been appointed assistant to the general manager in charge of maintenance of equipment, with headquarters at Chicago. The office of assistant to the general manager is abolished. In our issue of last week the name of the road was given as the Chicago & Alton through error.

G. H. Trenary, whose appointment as superintendent of the Chicago division of the Chicago & Eastern Illinois, with headquarters at Danville, is announced elsewhere in these columns, was born February 9, 1867. He was graduated from high school at Urbana, Ill., in 1883, and shortly after began railway work as messenger and call boy, learning telegraphy with the Indiana, Bloomington & Western. He was subsequently agent for that road and its successors at various points, and in 1892 became joint agent of the Chicago & Eastern Illinois, Cleveland, Cincinnati, Chicago & St. Louis and Toledo, St. Louis & Kansas City, at Veedersburg, Ind. Three years later he was made agent of the Chicago & Eastern Illinois, and the following year, in 1896, he became chief clerk to the general superintendent of that road. Mr. Trenary was promoted to division superintendent at Brazil, Ind., in July, 1899, and in November, 1904, was transferred to St. Elmo, Ill., in a similar capacity. He remained at that place until July, 1911, when he was made superintendent of the Illinois division at Salem, Ill., where he was located when he was appointed superintendent of the Chicago division, with office at Danville, as above noted.

G. H. Trenary.

Traffic Officers.

Louis F. Klein, general eastern agent of the Illinois Central at New York, has been appointed general eastern agent of the Western Maryland, with headquarters at New York, succeeding Orno M. Brown, resigned.

A. M. Reinhardt, who on June 10, was appointed assistant general freight agent of the Atchison, Topeka & Santa Fe Coast Lines, with headquarters at Los Angeles, Cal., was born December 1, 1878, at Lawrence, Kan. He was graduated from high school at Hemet, Cal., and began railway work with the Atchison, Topeka & Santa Fe in December, 1895, as messenger and student at San Jacinto, Cal. He was made relief agent of the Los Angeles division in July, 1897, and in September of the following year was transferred to Barstow, Cal., as cashier. From January to June, 1899, he was agent at Temecula, Cal., and the four months following, until November, 1899, he was agent at Perris, Cal. He was then made bill clerk at San Diego, Cal., where he remained until September, 1901, when he went to Hanford, Cal., as agent. From January, 1903, to February, 1906, Mr. Reinhardt was overcharge investigator and rate clerk in the claim department of the auditor's office. He was then until September of that year rate clerk in the general freight office, when he became chief clerk in the general agent's office at Los Angeles, Cal. On May 1, 1908, he was promoted to chief clerk in the general freight agent's office at that place, which position he held until his recent appointment as assistant general freight agent, as above noted. Mr. Reinhardt's entire railway service of nearly 18 years has been with the Santa Fe Coast Lines.

A. M. Reinhardt.

J. L. Durrett, assistant general freight agent of the Southern lines of the Illinois Central, has been transferred to Louisville, Ky., as assistant general freight agent, and F. C. Furry succeeds Mr. Durrett at Memphis. G. W. Maher has been appointed traveling freight and passenger agent, with headquarters at Seattle, Wash.; J. C. Lindsey, freight and passenger agent at Seattle, has been appointed commercial agent at that place, and the former position is abolished. T. F. Bowes, traveling freight and passenger agent at San Antonio, Tex., has been transferred to Los Angeles, Cal., as traveling freight agent. Effective July 1.

Engineering and Rolling Stock Officers.

William Bibby, roadmaster of the Grand Trunk at Allandale, Ont., has been appointed assistant general roadmaster of the Central Vermont, with office at St. Albans, Vt.

William D. Wiggins, superintendent of the Peoria division of the Vandalia, with headquarters at Decatur, Ill., has been appointed valuation engineer of the Pennsylvania Lines west of Pittsburgh, with office at Pittsburgh, Pa.

A. G. Armstrong, division foreman of the Atchison, Topeka & Santa Fe Coast Lines, at Los Angeles, Cal., has been appointed master mechanic of the Arizona division, with headquarters at Needles, Cal., succeeding M. P. Cheney, who is on extended leave of absence.

H. C. Estep, engineer of construction of the Southern New England Railroad Corporation, and the Southern New England Railway Company, having resigned to accept service with another company, the position of engineer of construction has been abolished, and H. A. Phelps has been appointed division engineer of the Southern New England Railway, with office at Providence, R. I., succeeding T. I. Ellis, resigned.

Frank Taylor Hyndman, formerly mechanical superintendent of the New York, New Haven & Hartford, has been appointed superintendent of motive power and cars, of the Wheeling & Lake Erie, with headquarters at Cleveland, Ohio. He was born on September 29, 1858, and began railway work in 1872, as machinist apprentice on the Central of New Jersey at Ashley, Pa., and from 1874 to 1877, was an apprentice in the shops of the Lehigh Valley at Wilkesbarre, then, for about three years, was brakeman and fireman on the Central of New Jersey. From March to November, 1880, he was a machinist on the Atchison, Topeka & Santa Fe at Raton, New Mexico, and from March, 1881, to August, 1883, was machinist on the Pittsburgh & Western and the Pittsburgh Locomotive Works, becoming engineman on the Pittsburgh & Western in August, 1883. He remained in that position until September, 1895, when he was made trainmaster, and from April, 1896, to November, 1902, was master mechanic of the same road at Allegheny. He was then, for one month, master mechanic on the Baltimore & Ohio at Pittsburgh, and from December, 1902 to July, 1904, was master mechanic on the Buffalo, Rochester & Pittsburgh. In July, 1904, he was appointed superintendent of motive power of the same road at Dubois, Pa., and the following November went to the New York, New Haven & Hartford as general master mechanic at New Haven, Conn. He became mechanical superintendent of

F. T. Hyndman.

the same road in May, 1906, resigning from that position on July 15, 1907, to enter the railway supply business, and at the time of his recent appointment as superintendent of motive power and cars, of the Wheeling & Lake Erie, was the Philadelphia, Pa., representative of S. F. Bowser & Co., Inc., Fort Wayne, Ind.

F. W. Williams, division master mechanic of the Chicago, Rock Island & Pacific at Cedar Rapids, Iowa, has been transferred to Manly, Iowa, as master mechanic of the Minnesota division. C. B. Daily, assistant superintendent of shops at Silvis, Ill., has been appointed master mechanic of the Cedar Rapids division at Cedar Rapids, succeeding Mr. Williams. P. Linthicum, general foreman at Horton, Kan., has been transferred to Silvis in place of Mr. Daily. O. S. Beyer, Jr., succeeds Mr. Linthicum.

W. M. O'Loughlin has been appointed supervisor of signals of the Northern Pacific, in charge of the maintenance of signal apparatus on the lines east of Mandan, N. D., with headquarters at St. Paul, Minn., in place of Wilfred Kearton, resigned. P. McGuire has been appointed assistant roadmaster of the Minnesota division, with office at Staples, Minn. G. C. Chittendon has been appointed roadmaster of the First sub-division, with headquarters at Pasco, Wash., in place of C. C. Blood, transferred. P. E. Anderson has been appointed roadmaster of the Walla Walla and Pendleton branches, with office at Pasco in place of J. G. Cutler, deceased.

Purchasing Officers.

J. F. Marshall, purchasing agent of the Wheeling & Lake Erie, has been appointed manager of purchases and supplies of the Chicago & Alton, with headquarters at Chicago, succeeding E. S. Wortham, assigned to other duties.

J. H. Beggs, whose appointment as purchasing agent of the Chicago & Eastern Illinois, with headquarters at Chicago, has already been announced in these columns, entered the construction department of the Atchison, Topeka & Santa Fe at Pueblo, Colo., on May 17, 1887, when that company was building its road into Denver. He was employed as timekeeper, gang foreman and general foreman, and when the road was finished he was transferred to the store department in February, 1888, remaining in that department until March 15, 1896. During this period he was located at Topeka, Kan.; Las Vegas, N. M.; Guaymas, Mex.; Benson, Ariz., and Raton, N. M., filling the positions of assistant storekeeper, storekeeper and fuel agent. Mr. Beggs was then made chief clerk to the master mechanic at Raton, N. M., and from February, 1902, to July, 1905, he was successively chief clerk to the mechanical superintendent at LaJunta, Colo., and Cleburne, Tex. On the latter date he left the Santa Fe to go to the Chicago & Eastern Illinois as chief motive power clerk at Danville. On February 1 of this year he was promoted to maintenance of equipment accountant, which position he held until he was appointed purchasing agent on June 18, as above noted.

J. H. Beggs.

OBITUARY.

Thomas J. Fitzgerald, formerly resident engineer of the Southern Pacific at Ogden, Utah, died in that city on June 24, aged 67 years. Mr. Fitzgerald was connected with the Central Pacific and Southern Pacific from October, 1868, until about January, 1912, when he retired owing to ill health and was placed on the pension list of that company.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

THE CHICAGO & EASTERN ILLINOIS has been authorized by court to buy 4 locomotives.

THE SAN ANTONIO & ARANSAS PASS will soon be in the market for about 10 locomotives.

THE CROFT LUMBER COMPANY has ordered one locomotive from the Baldwin Locomotive Works.

THE MARYSVILLE & NORTHERN has ordered one locomotive from the Baldwin Locomotive Works.

THE INDIANA HARBOR BELT has ordered 8 six-wheel switching locomotives from the Baldwin Locomotive Works.

THE CHILEAN STATE RAILWAYS are in the market for 20 narrow-gage locomotives, 20 broad-gage passenger locomotives, 10 broad-gage switching locomotives and 50 broad-gage freight locomotives.

THE NIGERIAN RAILWAYS OF AFRICA have ordered 8 Mountain type (4-8-2) locomotives from the American Locomotive Company. These locomotives will be equipped with superheaters and will have 18 in. x 23 in. cylinders and 42¾ in. driving wheels. In working order they will weigh 140,000 lbs.

THE SOLVAY PROCESS COMPANY, Syracuse, N. Y., has ordered 1 six-wheel switching locomotive for the Delray Connecting Railway. The dimensions of the cylinders will be 21 in. x 26 in., the diameter of the driving wheels will be 51 in., and the total weight in working order will be 159,000 lbs.

CAR BUILDING.

THE CHESAPEAKE & OHIO has ordered 1,000 gondola cars of 115,000 lbs. capacity from the Ralston Steel Car Company for the Hocking Valley.

THE BOSTON & ALBANY is making inquiries for 40 all-steel coaches, 4 all-steel postal cars, 4 all-steel combination passenger and baggage cars and 2 all-steel dining cars.

THE CHILEAN STATE RAILWAYS are in the market for 700 miscellaneous freight cars; for narrow-gage passenger cars as follows: 15 first-class coaches, 10 third-class coaches, 2 auto-motor cars and 7 baggage cars; and for broad-gage passenger cars as follows: 60 first-class coaches, 50 third-class coaches, 6 auto-motor cars, 5 baggage cars and 5 parlor cars.

IRON AND STEEL.

GENERAL CONDITIONS IN STEEL.—There has been a slight improvement in buying during the past week, and manufacturers believe that July will show an increase in orders as compared with June. There is more confidence now in the good crop outlook, and this is having its effect on the steel industry. It is highly probable that there will be a considerable curtailment of operations during the summer months, unless the buying improvement takes a distinct turn for the better. The railroads have been making only light purchases, but they are expected to enter the market heavily in the fall.

PROPOSED SPANISH RAILWAYS.—Spanish government railway engineers are in Lugo, Logrono, and Orense examining the land which it will be necessary to take in order to carry out the projects for the construction of three railways. The Ponteverra-to-Lugo Railway runs via Lalin, Province of Pontevedra, and will ultimately be extended to the port of Ribadeo, Province of Lugo, connecting the two ports of Marin and Ribado. The line will run through extremely fertile country, which has been without railway communication. A company to bid on the work when it is let has been formed. On the second line, Pamplona to Estella, it is proposed to build a station and a bridge over the Ebro River at Logrono. The third line will connect the town of Chaves in Portugal with Verin in the Province of Orense in Spain.

Supply Trade News.

The Union Railroad will use the Murray Keyoke, manufactured by the Keyoke Railway Equipment Company, Chicago, on 296 gondola cars now being built by the Pressed Steel Car Company.

W. E. Jenkinson has been made railroad representative for S. F. Bowser & Company, Inc., Fort Wayne, Ind., covering that territory vacated by E. F. G. Meisinger. In addition, he will take over the Southwestern and Pacific coast territory. He will cover the states from Texas to Oregon.

E. H. Outerbridge, who has been secretary and treasurer and managing director of the Pantasote Company, New York, since its organization, has been made a vice-president and managing director of that company. Raymond Harvey, who has been associated with Mr. Outerbridge for more than ten years, has been made secretary and treasurer of the same company.

The Protectus Paint Company, Philadelphia, Pa., has recently added to its business the sale of the products of the Barber Asphalt Paving Company, New York, particularly as used by railroads and car builders, making a specialty of asphalt insulating and building papers, asphalt felts and other asphalt fabrics, asphalt roofings, asphalt waterproofing compounds and asphalt Mastic for floors.

The Locomotive Arch Brick Company has taken over the patents and business of the Fire Clay Development Company, 1201 Chamber of Commerce building, Chicago. The company has recently been organized with the following officers: President, J. W. Moulding; vice-president, E. P. Stevens; vice-president and general manager, John L. Nicholson; secretary, T. C. Moulding. The Moulding family has been in the fire brick business since 1861, and now owns five large modern plants, for which the Locomotive Arch Brick Company will be the selling agents.

The annual report of the American Car & Foundry Company, New York, for the fiscal year ended April 30, 1913, shows gross earnings of $5,539,000, an increase of $1,346,000 over the preceding year. The net earnings were $3,328,592, an increase of $489,360, and after the deduction of $250,000 for maintenance and improvements the balance available for dividends was $3,078,592. Dividends of 7 per cent. were paid on the $30,000,000 of preferred stock, and of 2 per cent. on the $30,000,000 of common stock, leaving a surplus for the year of $378,592. Added to the previous surplus this makes a total surplus at the close of the fiscal year of $25,255,168. At the annual meeting of the stockholders on June 26, the retiring directors were re-elected.

TRADE PUBLICATIONS.

Jefferson Unions.—The Jefferson Union Company, Lexington, Mass., has published a small illustrated folder, telling how both William Tell and Jefferson unions hit the mark.

Graphite Brushes.—The Joseph Dixon Crucible Company, Jersey City, N. J., has published a small illustrated booklet pointing out the advantages of graphite brushes. Prices are included.

Oil Fuel Burners.—The Hauck Manufacturing Company, San Francisco, Cal., has devoted an illustrated booklet to its oil fuel burners for use in connection with locomotive and steel car repairs.

Denver & Rio Grande.—The passenger department has issued an attractive booklet entitled "Around the Circle," describing a special thousand-mile tour through the Rocky mountains, mainly in the state of Colorado.

Power Hammers.—Beaudry & Company, Boston, Mass., has published a small booklet illustrating and describing its power hammers, of which the Champion type is designed for light and heavy railroad, machine, and general forging.

Refrigerator Cars.—The Moore Patent Car Company, St. Paul, Minn., has published supplement No. 5, entitled, Perishable Products Transported Scientifically and Economically. This booklet gives the results of some interesting service tests.

Railway Construction.

Alexandria & Western.—According to press reports this company has given a contract to Henry J. Cox & Co., New Iberia, La., for building the first section of 14 miles. The plan calls for building from Alexandria, La., westerly towards Leesville, and eventually into Texas. The contract recently let calls for the excavation of 70,000 cu. yds. of earth, 50,000 cu. yds. of rock, constructing 2,300 lineal feet of wood trestle and 30,000 lineal feet of piling.

Big Sandy & Kentucky River.—An officer writes that the plans call for a line from a point on the Big Sandy division of the Chesapeake & Ohio at Dawkins, Ky., just south of Stafford, via Johnson, Blair, Denver, Patrick, Sherman and Riceville to Licking river, about 35 miles. Track has been laid on 10 miles, and contracts will be let in about 60 days to build a 15-mile section. The company may build a bridge over Licking river, and expects to develop a traffic in coal and forest products. S. N. Fannin, president; W. H. Dawkins, vice-president and general manager, Ashland, Ky., and Cunningham & Conners, consulting engineers, Huntington, W. Va.

Cache Valley.—An officer of this company, which operates a line from Sedwick, Ark., northeast to Light, on an irregular schedule, writes that the prospects are fair for building a 20-mile branch east to Paragould, but that the proposed line has not yet been definitely located. The plans call for an extension northeast to Thebes, Ill., 115 miles, and on the southern end southwest to Little Rock, Ark., 120 miles.

Chicago & North Western.—An officer writes that the St. Louis, Peoria & North Western building from Peoria, Ill., south to Girard, about 90 miles, has tracks laid from the South Pekin Yard to Auburn, about 60 miles, and about 40 miles of the line has been ballasted. Winston Brothers Company, Minneapolis, Minn., did the grading work, and the Cleary-White Construction Company, Chicago, the concrete bridge work. The extension on the south end, known as the Macoupin County Extension Railway, is to be an 8-mile coal spur from Benld, Ill., south to Staunton, thence into Madison county. Winston Brothers Company, Minneapolis, are doing the grading and bridge work. The bridges on this line will be wooden structures. (June 27, p. 1631.)

Chicago, Rock Island & Pacific.—The St. Paul & Kansas City Short Line has been put in operation for local traffic between Carlyle, Iowa, and Allerton, about 65 miles, a regular train having been put on the first of July. (November 1, p. 861.)

Elberton & Eastern.—An officer writes that this road is now in operation from Elberton, Ga., southeast to Tignall, 21.8 miles. An extension is projected from Tignall east to Lincolnton, 18 miles. W. O. Jones, president, and A. Wilson, chief engineer, Elberton. November 22, p. 1013.)

Foristell, Camp Creek & Northeastern.—Incorporated in Missouri with $30,000 capital to build from Foristell, St. Charles county, Mo., to Camp Creek, about three miles. The incorporators include H. J. Paddock, E. L. Squire, K. N. Horwitz and C. Garcia.

Gulf, Freeport & Northern.—Incorporated in Texas with $100,000 capital and headquarters at Freeport. The plans call for building from Freeport northwest through Brazoria, Fort Bend and Austin counties to Sealy, about 80 miles. C. L. Sharp, J. H. Bartlett, Marshall; R. E. Loggins, G. Edwards, Columbia; D. A. Barr, Freeport; W. L. Hall and C. L. Pierce, Damon, are incorporators.

Intercolonial Railway.—Plans for grade improvements and for double tracking the line between Moncton, New Brunswick and Halifax, Nova Scotia, are now under consideration.

Latour Creek.—Incorporated in Idaho to build from a point on the Oregon-Washington Railroad & Navigation Company, along Latour creek for about ten miles. It is understood that financial arrangements have been made. L. W. Butler, president; H. Neeligan, secretary-treasurer; A. E. Cowles, F. B. Foltz, of Kellogg, Idaho, and W. Jacques, are directors.

Lexington & Eastern.—See Louisville & Nashville.

LOUISVILLE & NASHVILLE.—An officer writes that preliminary surveys are being made for an extension of the Lexington & Eastern up Rock House creek in Letcher and Knott counties, Ky. The company has not yet authorized the construction of this extension.

MACOUPIN COUNTY EXTENSION RAILWAY.—See Chicago & North Western.

MOBILE & BALDWIN COUNTY (Electric).—An officer writes that the company is carrying out all the work except building drawbridges, with its own men on a line from Mobile, Ala., via Bay Minette, Volanta, Fairhope and Foley, to Pensacola, Fla., and that no contracts will be let. The maximum grades will be 2 per cent., and maximum curvature 4 deg., and when completed there will be five bridges on the line. The plans include putting up shops and office buildings. The company will use gas electric motor cars, and expects to develop a traffic in general merchandise, fruit, vegetables and farm products. W. B. Miller, president, Chicago; M. H. Miller, vice-president and general manager, P. O. Box 928, Mobile, Ala.

MOBERLY, HUNTSVILLE & RANDOLPH SPRINGS (Electric).—An officer writes that a contract has been given to the Jennings Construction Company, Joplin, Mo., for grading work from Randolph Springs, Mo., to Moberly, 12 miles, and a contract has been given to Ed. Freed, Moberly, for the concrete work on the same section. C. H. Dameron, president, and John J. Mundinger, chief engineer, Huntsville. (June 6, p. 1244.)

MORRISBURG & OTTAWA (Electric).—Bids are wanted up to July 8, at Ottawa, Ontario, for building 10 miles from Ottawa towards Morrisburg.

ST. LOUIS, PEORIA & NORTH WESTERN.—See Chicago & North Western.

ST. PAUL & KANSAS CITY SHORT LINE.—See Chicago, Rock Island & Pacific.

SHELBY COUNTY.—This company, which operates a ten-mile line from Shelbina, Mo., north to Shelbyville, is building an extension, it is said, northwest via Leonard and Cherry Box, to Novelty in Knox county. It is understood that the line is eventually to be extended northwest to a connection with the Atchison, Topeka & Santa Fe.

WATAUGA & YADKIN RIVER.—An officer writes that on July 1 this company began operating the line from North Wilkesboro, N. C., where a connection is made with the Southern Railway, west via Minton, Goshen, Marley Ford, Goulds, Elkville and Elkville Junction to Grandin, 20.51 miles. The company's men are now at work building extensions from Grandin, southwest to Lenore, where a connection is to be made with the Carolina & North Western, about 20 miles, also from Elkville northwest via Darby and Boone to Jefferson. There is considerable rock work to be done. Maximum grades to the summit of the Blue Ridge will be 2½ per cent., and maximum curvature 12 deg. There will be about 1,500 ft. of trestles and 1,500 ft. of tunnel work. The company expects to develop a traffic in lumber, iron ore, mica, talc, and farm products. W. J. Grandin, president; H. C. Landon, general manager and chief engineer. (See Yadkin River, October 25, p. 815.)

RAILWAY STRUCTURES.

BOWMANVILLE, ONT.—See Glen Tay.

BRIGHTON, ONT.—See Glen Tay.

COBOURG, ONT.—See Glen Tay.

GLEN TAY, ONT.—An officer of the Canadian Pacific writes that contracts have been given to the J. S. Metcalfe Co., Ltd., Montreal, Que., and work is to be started at once, putting up stations and other structures on the new line between Glen Tay Junction, Ont., and Agincourt, which are 183 miles apart. There will be brick stations with slate roofs and concrete foundations as follows: At Trenton, 23 ft. x 89 ft.; Brighton, 20 ft. x 77 ft. 6 in.; Cobourg, 28 ft. x 109 ft.; Port Hope, 20 ft. x 77 ft. 6 in.; Bowmanville, 20 ft. x 77 ft. 6 in.; Oshawa, 28 ft. x 109 ft., and at Whitby, 20 ft. x 77 ft. 6 in. There will be a number of other structures also put up at these places and at about 20 other points on the line, including wooden stations, ten 40,000-gal. water tanks, a 12-stall engine house, freight sheds, etc., in all about 85 structures.

HOBSON, OHIO.—An officer of the Kanawha & Michigan, writes that a contract has been let for building a new wood-working shop 100 ft. x 200 ft., at Hobson. The building will be of structural steel, covered with corrugated iron.

NEW YORK.—The Baltimore & Ohio is building an eight-story, reinforced concrete warehouse in New York, on land bounded by Eleventh and Thirteenth avenues and Twenty-fifth and Twenty-sixth streets, fronting 63 ft. on Eleventh avenue and 352 ft. on Twenty-sixth street; the remaining section of the lot is being prepared for team tracks. The concrete foundations of the warehouse have been completed; these were constructed on piling 80 ft. long, the work necessitated using about 4,000 piles. In driving the piles, great difficulty was encountered, such as sunken barges filled with stone, and three separate bulkheads had to be removed owing to the bulkhead line having been moved out from time to time. All foundation footings and the cellar floor will be waterproof, as the basement level is below high tide. The entire structure will be of reinforced concrete. The floors will have a carrying capacity ranging from 500 lbs. per sq. ft. on the first floor to 150 lbs. per sq. ft. on the top floor. The freight, or first floor will have rock mastic wearing surface and a special concrete with granolithic surface will be used on the other floors. The warehouse will be divided into three compartments with two elevators in each. Fire protection throughout the building will be provided, including a sprinkler system. Tracks will be laid within the warehouse with a capacity of 16 cars and the team tracks outside the house will have a capacity of 60 cars. All driveways will be paved and an electric gantry crane will be installed in the yard for handling heavy freight. Cars will be brought to the bulkhead on car floats. The building will be lighted throughout by electricity. The windows will be of wired glass with metal frames, and all doors will be fireproof. The cost of the freight house will be about $500,000, exclusive of the land.

OGDEN, UTAH.—The Denver & Rio Grande has asked for bids for the erection of a freight depot to cost about $75,000.

OSHAWA, ONT.—See Glen Tay.

PORT HOPE, ONT.—See Glen Tay.

SALT LAKE CITY, UTAH.—The Denver & Rio Grande has announced that new shops will be erected as soon as possible on the site of the shops destroyed by fire on June 18. Work has already been started on temporary shops.

TRENTON, ONT.—See Glen Tay.

WHITBY, ONT.—See Glen Tay.

FLOOD DAMAGE IN NATAL, AFRICA.—The total cost of repairing the damage done to the railways in the province of Natal by the recent floods, and effecting certain improvements with a view to reducing the possibility of similar damage occurring in future, will be about $276,250.

NEW RAILWAY STATION AT PRETORIA, SOUTH AFRICA.—The new railway station at Pretoria is an exception to the almost general neglect of architecture in South African station buildings. The site is a happy one, as the building terminates a vista of nearly a mile through Market street and Church square to the valley and distant hills on the north. The ground in front of the station has been laid out with formal avenues, fountains and grass lawns, combined with ample space for the street car service and all wheel traffic. The building is three stories in height, built on the outside entirely of flatpan (a sandstone from the Orange Free State). The roof is covered with red "Italian" tiles manufactured at Vereeniging, on the Vaal river and this is the first time these tiles have been used on a public building in South Africa. The roof is crowned by a central clock tower, also of stone. The dominant architectural notes are the arched porte cochere to the main entrance on the ground floor, with a long arcaded loggia on either side, and the deeply recessed columnar features in the center of the three principal facades. The deep overhanging eaves protect the walls and windows from sun and rain. The west elevation contains covered a main exit porch with granite columns.

Railway Financial News

Atlanta, Birmingham & Atlantic.—The interest on the $4,700,000 joint receivers' certificates, which certificates matured July 1, was paid, but the principal was not paid. The following protective committee has been formed: Howard Bayne, George C. Clark, Jr., Harold Benjamin Clark, Lewis B. Franklin and Carl E. Steere, with G. E. Warren, secretary.

Canadian Pacific.—A. R. Creelman, who has resigned his duties as general counsel, continues a director and on occasion will act as special counsel.

Chesapeake & Ohio.—This company has sold to Kuhn, Loeb & Co. and the National City Bank, both of New York, $3,500,000 5 per cent. notes, maturing June 1, 1914.

Chicago & Eastern Illinois.—Judge Carpenter, in the United States district court at Chicago, has given the receivers authority to issue $4,000,000 6 per cent. receivers' certificates to pay bond interest and for repairs and improvements to rolling stock.

Chicago, Milwaukee & St. Paul.—Clark, Dodge & Co. and Potter, Choate & Prentice, both of New York, are offering the unsold portion of the $2,999,500 Puget Sound & Willapa Harbor 5 per cent. 5-year trust certificates, guaranteed principal and interest by the Chicago, Milwaukee & St. Paul, recently sold by the St. Paul, at 98¼, yielding 5.40 per cent. on the investment.

See also Pacific & Eastern.

Detroit, Toledo & Ironton.—On June 28 the Northern and Southern divisions of the D. T. & I. were finally sold at auction to Otto T. Bannard and N. Buckner, both of New York, for $1,650,000. The Ohio Southern division was recently sold. (See *Railway Age Gazette* of May 30, 1913, page 1206.)

Erie.—The $3,396,000 New York, Lake Erie and Western Docks & Improvement Company first extended mortgage 5 per cent. bonds, which are guaranteed principal and interest by the Erie, are being offered by Kissel, Kinnicutt & Co. and White, Weld & Co., both of New York, at 100½, yielding over 4.95 per cent. on the investment. The bonds are dated July 1, 1913, due 1943, and are first lien on the tidewater freight terminals of the Erie in New York harbor.

International & Great Northern.—This company has asked the Texas railroad commission for permission to issue $680,000 bonds to pay for additions and betterments. The intangible assets board of Texas has completed its valuation and it is understood that the International & Great Northern valuation has been made such as to permit this bond issue by an amended report of the commission's engineer. The total increase in the intangible assets of railroads in Texas is placed at $5,702,248.

Missouri, Kansas & Texas.—The intangible assets board of the state of Texas has placed the intangible assets of the M. K. & T. of Texas at $20,751,450. This places the M. K. & T. second in the total list of roads having the greatest intangible values in the state, and the M. K. & T. increase over the previous year was the greatest shown by any road in the state.

Mobile & Ohio.—This company has called for payment on August 1 the remaining St. Louis & Cairo 4 per cent. collateral bonds which have not been exchanged for St. Louis division 5 per cent. bonds. There were originally $2,500,000 of these bonds outstanding.

Nashville, Chattanooga & St. Louis.—On July 1 the company paid the $6,300,000 7 per cent. first mortgage bonds which matured on that date.

National Railways of Mexico.—In regard to rumors that the National Railways of Mexico had been put into the hands of receivers, President Huerta, of Mexico, telegraphed to Ladenburg, Thalmann & Co., New York, on June 27 that "Mr. Brown is now and will continue in the presidency of the National Railways of Mexico."

Oakland, Antioch & Eastern.—This company has asked the California railroad commission for permission to issue $1,000,000 additional first mortgage 5 per cent. bonds to complete the road to Sacramento. If this permission is granted it will make the total bonds outstanding $4,000,000.

Pacific & Eastern.—*The Commercial & Financial Chronicle* says: "Within a short time there have been in existence two Pacific & Eastern Railway Companies, one running from Medford, Ore., toward the east, the other located in Washington and running from Willapa Harbor east. It was the last mentioned company which recently had its name changed to Puget Sound & Willapa Harbor Railway Company and then passed into the control of the Chicago, Milwaukee & St. Paul. The Oregon company is still controlled by the Spokane, Portland & Seattle."

St. Louis & San Francisco.—On Friday of last week the receivers were given permission by the United States district court at St. Paul to pay the interest due July 1 on the outstanding $68,557,000 refunding 4 per cent. bonds, the $5,803,000 general mortgage 6 per cent. bonds, the $3,681,000 general mortgage 5 per cent. bonds, the $1,558,000 consolidated mortgage 4 per cent. bonds, the $2,923,000 Fort Worth & Rio Grande 4 per cent. bonds, and on equipment trust certificates and principal of trust equipment certificates falling due on that date. Payment is to be made from current funds on hand and from what sum the company finds it necessary to borrow.

St. Louis Southwestern.—On July 1 the Stephenville North & South Texas, which runs from Gatesville to Stephenville, Tex., 75 miles, and from Hamilton to Comanche, Tex., 32 miles, was taken over by the St. Louis Southwestern and will hereafter be operated as part of the Waco division.

Southern Pacific.—See the decree of the circuit court in the dissolution suit elsewhere in this issue.

Spokane, Portland & Seattle.—See Pacific & Eastern.

Stephenville North & South Texas.—See St. Louis Southwestern.

Union Pacific.—The plan, which includes the exchange of $38,292,000 Southern Pacific stock for $42,547,200 Baltimore & Ohio stock owned by the Pennsylvania, and for the disposal of the remainder by the Union Pacific, has been approved by the attorney general of the United States. See decree elsewhere.

Dining Cars for India.—Two additional dining cars have been sanctioned for the North-Western State Railway of India during 1913-14.

Proposed Line for Argentina.—T. P. Conde & Co. have renewed their petition to the Argentine congress for permission to build and operate a railway from Gualeguaychu to the port of Corrientes.

Argentine Railway Concessions Asked.—T. Lacroze has applied to the Argentine congress for leave to construct a line from Pereyra and Pinero stations on the Central of Buenos Aires Railway to Los Toldos, passing through Chivilcoy; a line from a point on the former to Lujan with electric traction between Buenos Aires and Lujan; and permission to double track the lines between General Sarmiento and Zarate, and from Enpalme to Giles.

Oil Fuel in India.—Some further particulars are now to hand of the important trial of oil-burning locomotives which is about to be carried out on the North-Western State Railway of India. There will be a six months' preliminary trial for the purpose of testing different types of burners, followed by a 12 months' trial to determine the relative values of oil and coal. Six heavy passenger engines are to be equipped with oil-burning apparatus for the latter trial and work against six coal-burning engines. Three engines of each kind will work on the mail trains and three of each type on the passenger trains between Karachi and Padidan. This is not, of course, the first time oil has been tried in India, there having been tests in 1882, 1889, 1902 and 1903, the results of which were very inconclusive. The price at which the first contract for between 6,000 and 7,000 tons of oil has been placed makes it unlikely that much saving will be shown. The contractors for the oil are to settle the system to be adopted, and are to provide an oil burning expert to coach the railway staff in order that there may be no complaints.